THE

SOUTHERN AGRICULTURIST.

AUGUST, 1830.

PART I.

ORIGINAL CORRESPONDENCE.

ART. 1.—*On making Sugar from Beets, in a Letter from the* Hon. WILLIAM JOHNSON, *of South-Carolina, to the* Hon. JACOB BURNETT, *of Ohio.*

I HAVE not been unmindful, my dear Sir, of my promise to furnish the State of Ohio with the necessary information, to enable her to determine whether it will be to her interest to embark in the culture of Beets for manufacturing Sugar. My friends, at Washington, were amused at my enthusiasm, when I expressed the opinion, that the day might arrive when Ohio would sell sugar to Louisiana.

I will not be discouraged by their (at present) very reasonable doubts. I saw the time when the first projector of raising cotton in the interior of South-Carolina, for a crop, was ridiculed as a *visionary.* And when poor Fitch had not only projected the application of steam to boat-navigation, but actually succeeded as early as 1788, in running a boat between Philadelphia and Trenton, on principles scarcely varying from the steam machinery now in use, he was still left to die neglected as a *visionary*, or at least the projector of an idle and impracticable scheme. So with regard to the making of Sugar from Beets, in order to render France independent in war and in peace of the industry and national advantages of her natural enemy; we all remember how Bonaparte was ridiculed in the British prints. Yet, although labouring against diffi-

culties which they did not at first comprehend, and destitute of means which perseverance and philosophy have since supplied, the French have at length succeeded; and in a country always famed for its agricultural advantages, we find the making of Sugar from the Beet set down as the *most promising* sources of her agricultural wealth.

Already, in 1825, was the labour of the manufacturer separated from that of the producer of the article; not less than one hundred manufactories were in successful operation, producing between four and five millions of pounds of Sugar;* their number was increasing, the quantity rivalled the product from the cane, and it was confidently expected that it would soon attain to the full consumption of France, estimated at one hundred millions of pounds. If so, it will soon after become an export. My attention was drawn to this subject in the following manner:—I had been for several years experimenting upon the production of the sugar cane in the vicinity of Charleston, and fully succeeded in raising as fine cane as any that I had ever read of. I expressed the juice and found its specific gravity equal to that of Jamaica, and had found no difficulty in making an equal proportion of sugar, in a few experiments made under every disadvantage. It was, therefore, fully ascertained that we might make sugar, and some others having equally succeeded in raising the cane, there was produced among us a very general inclination to adventure upon that branch of agriculture. But there appeared to me one important question yet to be decided, before a prudent man ought to venture upon an experiment attended with great expense and exposed to serious casualties. I had at the same time made experiments upon raising the Beet, and was struck with the great facility and certainty attending its production, and the astonishing size and quantity to which it could be carried. Compared with the production of other countries, I saw nothing in the books to surpass, if any thing to equal my own results.

Here then three questions presented themselves:—

1st. Whether considering how vast was the proportion of the habitable globe adapted to the culture of the Beet, (for I have seen no country too hot or too cold for it, and no soil scarcely that may not be made to produce it,) there

* The Art of Making Sugar from Beets, by M. Durbanfaut, page 533-4.

exists not a possibility that it may in time supersede the sugar cane, restricted as the latter is by nature to particular climates?

2nd. Whether in a country having such a fast hold upon the valuable articles of rice and cotton, we should not be verifying the apologue of the dog and his shadow, in abandoning a certainty for an experiment. Productions abandoned by one country are generally taken up by their wise neighbours, and not always to be resumed at will?

3rd. Whether the Beet, under all circumstances, can be cultivated to advantage for making Sugar, or can maintain a successful rivalship with the cane?

For the solution of these questions, I turned my eye towards France, where I knew the attempt had been made twenty years since; the history of the progress and present state of the experiment had not reached me, and in fact, had long ceased to be an object of interest or inquiry among us.

I took measures to procure from a friend in Paris the latest and most approved work upon the subject, and accordingly received that, of which I now propose to furnish you with the necessary extracts.

The title is, "The art of making Sugar from Beets. The author is M. Durbanfaut, member of the society for encouraging National Industry, correspondent of the Royal and Central Agricultural Society of Paris, &c. &c. published by Bachelur, quai des Grand Augustin, No. 55, in the year 1825. The author professes to owe much to the works of the Count Chaptal, and of Monsr: de Dombersli, whom he often quotes.

Besides an introduction of sixteen pages, the work contains 558 pages, octavo, with cuts of all the apparatus and machinery used in France, as well for grinding and pressing the Beet as for boiling the Sugar. The work is very minute and elaborate, furnishing, according to the judicious mode of the French writers, all the information a reader can require, and not leaving him under the necessity of looking beyond the book he is perusing. If the perusal of it has not finally solved the three questions above suggested, it has, at least, satisfied me that throughout our country, wherever the cotton, rice, or cane cannot be cultivated to advantage, the Beet may well compensate the

cultivator by the production of Sugar. But of this, I propose to furnish all the data necessary to enable our fellow-citizens to determine for themselves.

The author introduces his subject with an eulogium which I translate verbatim: "Among all the numerous branches of manufacturing industry (says he) which unite best with agricultural industry, there is no one more worthy of the attention of the cultivator than the fabrication of Sugar from the Beet-root. It promises to his fortune considerable advantages, while to the country it presents a new source of riches."

He then goes on to show how admirably it is adapted to unite and promote both those great agents of national prosperity without exhausting the soil, or at all interfering with the cultivation of those plants which furnish food to man.

The rest of the introduction is occupied with a summary of the history of the application of this plant to the production of Sugar, and is no further of importance than as it serves to shew that it has triumphed over more than ordinary difficulties, until at last, it is firmly established as an important article in the French husbandry, and as a rival of the cane, capable of maintaining a competition in peace as well as in war.

Although the presence of saccharine matter in the Beet was discovered by a Russian chemist, as early as 1747, it appears to have attracted little attention until the experiments of Achard, made forty years after, suggested the practicability of turning the discovery to economical purposes. Some error or awkwardness in making scientific experiments upon it in 1800, seems to have nearly prostrated every hope that had been previously entertained; until in 1810, when the pressure of war and blockade having raised Sugar in France to an enormous price, the discovery was resorted to, and finally crowned with success, yet it was not until after great losses and disappointments had been sustained by individuals, that the public became possessed of that mass of experimental knowledge of which we are now at liberty to avail ourselves. "People at first imagined (says the author) that it was only necessary to have the roots in order to make Sugar, and that the species, the mode of culture and of preservation, the nature of the soil and manures, nay, even the process of extraction,

were, if not absolutely immaterial to the results, at least, of so little importance that they might be neglected."

The culture of the Beet appears to have been but partially known in France at the time of the experiments in 1810. The author mentions the Scarcity Root as the only species cultivated at that time, (p. 3,) it was to that the first manufacturers had recourse, and experience has since established, that of all the species this is the least adapted to the production of Sugar.

This was the first capital error of the French, the next was the effort to raise the roots to the greatest size possible, and the third, stripping the leaves for their cattle before they gathered the roots, or at least, before they were transported to the factory.

It has since been ascertained that large roots are less productive than small, and stripping the leaves is held to impede the elaboration of the juice.

It is, nevertheless, conceded, that sound Beets of all sizes, and all species, and under every mode of cultivation or treatment will produce Sugar; but the quantity and quality are held to be materially improved by the choice of species and the mode of treatment.

On this subject, the interest of the cultivator and manufacturer appear to have clashed. Since the former, who sold by weight was interested in forcing the growth of his plants, while the interest of the latter lay in purchasing as little water and pulp as possible in proportion to the quantity of saccharine matter.

The necessities of both soon brought their interests to a national level; one discovered that price could compensate for the loss of quantity, and the other invented the means of adopting the process of extraction to Beets of all qualities and sizes.

Of the most approved kind of Beet for making Sugar.— As my object is to condense as much as possible the information wanted on this subject, omitting, I hope, nothing that is necessary to be known, I will wave all attempt at a general description of the Beet and its varieties, and describe, with as much precision as possible, those kinds to which experiment has attached a positive preference.

The first is a white Beet called the Beet of Silesia, described as round, pear-shaped, leaves white, (or light green) and flesh white and firm. This was the kind recommend-

ed by Achard, and the experience of fifteen years in France had confirmed its reputation. It is described as always producing a small root difficult to grind, and producing but little juice comparatively, but that juice abounding in sugar. The cultivation of it also requires less labour, and its preservation is more easy.

After this kind, opinion is represented as varying greatly upon the order in which other kinds of Beet rank in quality and productiveness or other circumstances recommending them to a preference. Some manufacturers gave the preference to a variety of the yellow Beet, called the Beet of Castilnaudry. Its characteristics are, pear-shaped elongated, of a moderate size, flesh yellow, leaves green with a yellowish cast. I have cultivated this species and noticed the superior saccharine consistency of its juice. Others prefer a kind which is thus described, flesh white, skin yellow, root pear-shaped, and leaves white, (or rather light green.) And as this is probably produced between the white and yellow Beets above described; it is very possible that it may unite and perhaps improve the properties of both. Others again, are partial to a Beet with a rose coloured skin and white flesh, which is described as a sub-variety of the white Beet in these words—rose coloured, pear-shaped, flesh white, sometimes a little tinged with red, and leaves white.

This diversity of opinion, the author very properly surmises, may proceed from the difference of climate, soil, and culture of the various departments in which the cultivators reside. It is not impossible that the experience of our own planters may result in giving preferences variant from those of other nations, when they come to extend the cultivation of the article, the variety and sub-varities of which may multiply indefinately, since all the different kinds of Beets mix and blend when cultivated in the same region of country; and every kind will be more or less affected by soil, climate, exposure, manure and cultivation.

But one general rule he considers as established, as well by the manufacturer as the chemist—that the productiveness of the Beet in Sugar, is in an inverse ratio to the tendency of the kind to produce a large juicy root. And this is exemplified in the instance of the Silesian Beet, and the Scarcity Root, both white beets, but the former producing a small, the latter a large root.

Still, however, it does not follow, that the cultivation of the smaller root is the most economical, since the same land and labour may possibly produce so much more of the larger kind, as greatly to overbalance its defectiveness in the proportion of saccharine matter.

The author, after examining this question. comes to a conclusion, which, I will give in his own words: "I conclude, therefore, that there is no kind of bad Beets, but a vast deal of bad management, and that by varying your management with the different roots on which you are operating, you would constantly obtain good results. This is not my opinion alone, but that of a distinguished manufacturer, (M. Crispel d'Arras,) with whom it is confirmed by long experience and judicious observation."

In making purchases, the manufacturer has recourse to the air-bubble; the cultivator may do the same or determine the specific gravity of a small quantity of the juice weighed against an equal quantity of rain, spring or distilled water.

The nature of the season will, of course, vary the results, the juice will be more aqueous if the year has been marked by the fall of more rain than ordinary; and one place will in the same year produce a richer juice than in another, probably as the water rests or passes off. Great changes are continually occurring in the variety of the plant, requiring a corresponding care of the cultivator, if he wishes to preserve a particular kind. These changes he discovers by observing the leaf, and selects his roots for seed, both by that indication and by the vigorous growth of the plant. These are set out at the proper season two and a half or three feet apart. When the seed is ripe the stocks are cut and the seed rubbed off. It is then spread on clothes in the open air, and then in the sun to dry. Without these precautions, the seed is so apt to heat as certainly to destroy itself or its species. Twenty roots are generally sufficient to yield a bushel of the seed.

It is not true that the Sugar is destroyed in the plant that produces seed. These roots will yield as much Sugar as they would the first year of their growth.

Soil and Climate.—Whether every kind of Beet is equally adapted to every climate, is a question which I will not undertake to answer. I know that the small white Beet, the yellow Beet, and particularly the turnip-rooted red

Beet will thrive well in South-Carolina. Of other descriptions I have some reason to doubt. But in climates beyond the culture of rice, cotton, and cane, there is little reason to apprehend a failure in any kind of Beet. Our author asserts that in the most northern parts of France it thrives best, and is of opinion, that Russia will prove the most favoured country in the making of Sugar from the Beet. He asserts that in Germany, Russia and Silesia, where the experiment had it origin, the juice of the Beet is richer generally in saccharine matter than in France, and to this cause he attributes it that Mons. Achard in his very first experiment made, necessarily, under disadvantages, produced as great a proportion of Sugar, as has ever been produced in France, under the aid of all the modern improvements. He communicates also the fact, that in 1809, manufactories of Sugar from the Beet had already been established near Moscow, and were thriving and multiplying. This is enough to satisfy every mind that there are few parts, at least of the middle and northern regions of our country in which the climate is not adapted to its production. Nor is there, perhaps, any soil adapted to the ordinary objects of culture in those states in which it may not be made to grow. Yet, on this subject, there must certainly be much discrimination. Thus it will not thrive on a cold stiff clay; nor on poor or exhausted land, unless the latter be well manured. But the author asserts and analogy would suggest, that in high dry lean situations, where the growth is not luxurient, the juice is more highly charged with saccharine matter, than in lower moist situations where it attains to a great size. Perhaps the most practical and intelligible rule is, that any land that will produce grain or potatoes luxuriantly, will produce the Beet well, and certainly any land that is in a state to produce good turnips will produce fine Beets. A rich warm, open, dark loam will be found the best adapted to it, and the size of the root and quality of the juice will be improved by depth of soil and a favourable exposure. And whatever be the soil, it should be prepared so that the plant may penetrate eight or ten inches. A tongue-plough following in the furrows of a bar-share, would not be an unappropriate preparation for the rows.

(To be continued.)

ART. II.—*An account of the Treatment and Product of two acres of Corn; by* Dr. JOHN S. BELLINGER; *addressed to the Agricultural Society of South-Carolina.*

[COMMUNICATED FOR THE SOUTHERN AGRICULTURIST.]

Gentlemen,—I shall state the result of an experiment upon four acres of high-land, planted the last season; two acres of which, planted with flint corn, I offer for your premium, and the two others by way of comparison. A piece of land 210 feet, by 420 feet, was listed with the hoe, at the distance of four feet; the beds being nearly North and South in their direction. Acre No. 1. was planted thus: the first thirteen rows, one grain of corn every twelve inches along the beds; the next quarter, one grain every two feet on the beds; upon No. 3. one grain every two feet and an half; and on the last quarter, (also thirteen rows,) one grain was planted every three feet on the beds. Acre No. 2, was divided into half acres, each containing twenty-six rows, and in No. 1, of this acre, the corn was planted every four feet on the beds. On No. 2, the corn was planted at the distance of five feet along the beds. These two acres were planted on the 11th of April—the first hoeing was on the 26th, when they were slightly drawn up. On the 27th a furrow was run on each side, so as to throw the earth from the corn. In acre No. 1, rotten cotton-seed, at the rate of five bushels to each row of corn, and in acre No. 2, fresh cotton-seed, at the rate of six bushels, was thrown along the furrows, and both acres were then drawn up to cover the seed. On the 28th of May, acre No. 2, was drawn up for the third time; the cotton-seed having vegetated so much as to render this necessary; and acre No. 1, had received a second drawing up. On the 4th of June, both acres were again hoed, and on the 23d of the same month, each acre was bedded up very heavy. On the 3d of July, each acre was hoed, and upon the 14th of July, each acre was drawn up well for the last time. At this time, the half acre, 4 by 5 feet, was much more forward than the rest of the corn, and generally three silks on each stalk; and the quarter of an acre of an acre, No. 1, with one stalk every foot along the beds, much more backward. On the 26th of August, stripped the blades from each acre, and when well cured, the product was thus: From acre No. 1, the

quarter No. 1, made 309 lbs. at the rate of 1236 lbs. to the acre; No. 2, 285 lbs. at the rate of 1140 lbs. to the acre; No. 3, 277 lbs. at the rate of 1108 lbs. to the acre; and No. 4, 198 lbs. at the rate of 792 lbs. to the acre—this acre made 1069 lbs. of blades. Acre No. 2, the first half, made 275 lbs. at the rate of 550 lbs. to the acre; and the other half, (4 by 5 feet,) made 208 lbs. at the rate of 416 lbs. to the acre—this acre made 516 lbs. In the months of June and July, rain was much wanted, and this corn, especially the half acre planted thick, suffered much, and the quarter No. 1, fired much, so much so, I must conclude one sixth of the blades were lost. The acre No. 2, did not appear to feel the effects of the drought so much. One of the comparative acres, planted seven feet square, was poor land, manured in each hill with two quarts of stable manure, and two stalks left in each hill; the other acre was old land, also, but moderately good, having been manured some years ago. This acre was planted with single stalks, every three feet, upon beds five feet apart. These two acres were well cultivated. The produce from those four acres which were harvested on the 24th of last October, as Mr. W. R. Bull's certificate shows, was as follows: Acre No. 1, quarter No. 1, contained at the rate of 10,890 stalks; made at the rate of 49 bushels and 16 quarts, and took more than 222 stalks to the bushel. Quarter No. 2, at the rate of 5445 stalks to the acre, made at the rate of 44 bushels and 24 quarts, and took not quite 124 stalks to the bushel. No. 3, planted at the rate of 4356 stalks to the acre, made at the rate of 36 bushels to the acre, and took 727 stalks to the bushel; and No. 4, planted at the rate of 3630 stalks to the acre, made at the rate of 33 bushels to the acre, and took not quite 111 stalks to the bushel. This acre made 40 bushels, 3 pecks, and 2 quarts. Acre No. 2, the half No. 1, planted at the rate of 2722 stalks to the acre, made at the rate of 29 bushels and 22 quarts, and took about 90 stalks to the bushel; and the other half, planted at the rate of 2178 stalks to the acre, made at the rate of 23 bushels and 3 pecks to the acre, and took about 82 stalks to the bushel. This acre made 26 bushels, 2 pecks and 7 quarts. The acre planted 7 feet square, contained 1777 stalks, made 14 bushels and 5 quarts, and took about 127 stalks to the bushel. The other acre, (3 feet by 5,) contained 2904 stalks, made 17 bushels, 3 pecks, and 6½ quarts, and re-

quired about 161 stalks to the bushel. It was very evident from the number of *suckers*, &c. that the number of stalks of corn in the acre No. 2, were not sufficient for the quantity of manure, and I now wish I had suffered them to mature, as I have reason to conclude more corn would have been made.

The result of this experiment confirms many others in the conclusion, that to produce *any* thing like a great crop of corn, there must be many stalks; and from my former experience, I conclude these two acres should have been planted at least five weeks sooner.

With respect, your associate,

JOHN S. BELLINGER.

February 22d, 1830.

ART. III.—*On the Cultivation of the Sweet Potatoe; by* J. D.

Mr. Editor,—Agreeable to your wish, expressed in your favour of the 25th ult. I proceed to give you my mode of cultivating the sweet-potatoe.

My potatoe crop generally succeeds a crop of corn. In order that your readers, as well as yourself, should have a just idea of the situation and state of the ground, I must be permitted to say in what state I leave the land in the fall, while the corn is on it. I plough the corn but one way, which necessarily leaves the land in pretty large beds, when the corn is laid by, at the distance of five feet apart. In the winter, I list down all the rubbish, consisting of grass, pea-vines and corn-stalks, into the valley between each row. About the middle of March, with a plough resembling the Dearborn, of a size as large as a strong horse can pull, I commence forming my beds, by throwing a furrow upon the rubbish listed down in the winter; continuing to throw furrow after furrow, until the old corn-bed is thrown into the valley, when a bed of considerable size is formed, if your plough and ploughman is good. Let the ground lay in this state until you begin to plant, which should be about the middle of April, then set the hands to drawing the beds with hoes; each hand by drawing the loose earth left by the plough, will make up a half acre per day. The next

day I begin to plant, (for the sooner you begin to plant after the bed is made, the better,) by chopping with a narrow hoe, or the corner of a broad one, about twelve inches apart, in which drop two pieces of seed, and cover them about two inches deep. If it should be necessary to hoe the potatoes before the vine commences running, shave very lightly with the hoe all the grass into the valley. About a week after this, take a plough similar to the one with which you formed your beds, run a furrow on each side, throwing the dirt upon the bed as high as it can be done with the plough, and break up the middle of the valley with a large shovel or fluke plough. Let the field lay in this state, unless the grass forbids, for ten days or a fortnight, then give your potatoes an ample drawing up with the hoe; the vines will soon cover the bed. If it should be necessary after to take grass from the potatoes, it must be done by hand-picking. In digging potatoes for use, I generally put it off as long as possible. I am of the opinion that potatoes grow more in one week in the months of September and October, than in the month previous; besides, if you begin to dig before your neighbours, the whole black population of the neighbourhood will live on you, for negroes are generally liberal at the expense of their masters.

Before the season arrives for planting from the vine, I will endeavour to give a small sketch on that part of a potatoe crop. J. D.

N. B.—I always choose strong dry soil, mixed with sand, and never manure. No doubt manure is of advantage.

ART. IV.—*On the Cultivation of the Long Staple Cotton; by* CHATHAM.

To the EDITOR of the SOUTHERN AGRICULTURIST.

Near Savannah, 18th June, 1830.

Sir,—Your letter requesting to be informed of the plan followed by myself or others in the cultivation of the long staple cotton, &c. was received in due course. After Mr. Seabrook's luminous letter upon that subject, it is with some diffidence that I give you my system, differing as it

does, in some parts, materially from his. But, sir, as it is freely asked for, it shall be as freely given, let it make for me or not.

Having three entire changes of fields upon the estate on which I reside, it is the settled plan, instead of clearing land, to list in, between hoeing and harvest, all the grass, weeds, &c. upon that field intended for the next year's crops. This list remains untouched throughout winter, and long before the tap-root enters it, its vegetable mass is completely decomposed. A re-listing takes place about the 20th of March, and about the 1st of April I begin to bed, making pretty large beds, and commence putting in the seed about the 5th—bedding and planting alternately until the crop is all in the ground. By this time, if any thing of a favourable season, that first planted is ready for hoeing, which may be commenced forthwith, carefully stirring all the ground, and with the fingers, loosing it around the cotton. Every operation of the hoe after this, is to haul directly up (putting the earth freely among the plants, if not too wet,) except the last, which is done obliquely, the operator standing in the alley, and taking great care not to come too near the cotton, nor to cover the lower limbs. I plant in short hills, leaving the width of the hoe between each, and sow from eight to twelve seed in a hole, covering with the foot. The first thinning takes place as soon as the fifth leaf begins to appear, leaving only *two* stalks in a hole, all the middle being taken out. When these become the least crowded, one is taken out and the thinnings are continued until, upon *rich* land, only *twenty-one* stalks remain on a task row—*five feet apart, one stock in a hill;* lighter parts require a greater number, but no where more than thirty-five to forty. The plan pursued in thinning, is this: upon land where cotton grows three feet high, thirty-five to forty—four feet, thirty to thirty-five—five feet, twenty-five to thirty—six feet and upwards, twenty-one. I am aware of the strong prejudices I approach, when I speak of twenty-one stalks upon a task-row, or even thirty-five to forty, and shall perhaps be protested against as an innovator, with all the force and solemnity which our language permits. I shall, nevertheless, continue to plant thin, and conclude, when a bag of three hundred pounds is made to the acre (which is done upon *rich* land,) upon land, which, under the old plan, (thick planting,) would not yield one

hundred and fifty, and sell it for only twenty or twenty-five cents, that I am somewhere in the neighbourhood of a "secret price." Situated rather without the influence of salt air, quantity and not quality has been my object, which this plan secures to me.

I frankly confess this system did not originate with me, but it has been pursued for several years with unvaried success. I do not know if the hypothesis, that the quantity decreases in the inverse ratio of its fineness, has ever been established; if not, those gentlemen having rich lands, and understanding how to grow the cotton of the "secret price," might reap a rich reward by trying the system here offered to the public. As soon as any considerable quantity of my cotton is a little over five feet high, it is topped, without any regard to the time; and as the balance attains that height, it is also topped. The suckers, or sprouts, are taken off when they get to any size, (small ones do no injury,) the task being one acre to the hand, who should be a careful one. The crop is laid by from the 1st to the 10th of July, and any grass coming up, likely to do injury, is taken off, with the fingers—*a hoe never being permitted among it.* The ditches should be *perfectly clean*, and kept so, as an excess of water, is, perhaps, the greatest enemy (caterpillars aside,) which cotton has to encounter, and this plainly points to the necessity of having *many*, and they clean. In the picking season, a few of the most intelligent hands are sent ahead of the rest, and pick off of those stalks only which are most prolific, leaving every thing the least stained or defective; from this, which is kept separate, is procured my next year's seed. The hands should not be sent out early in the morning to pick, while the cotton is yet wet with the dew, if they are, much of it will be unavoidably stained, by coming in contact with the wet leaves; this is the reason why we have such a great proportion of our first cotton, which should be the purest and best, stained. They can be profitably employed upon the scaffold, culling the previous day's work, until the field is dry. Cotton gathered in this way requires but little sun.

If you should think this worth a place in the *Agriculturist*, you may, if you desire them, have at a future day, my ideas on clearing land and ditching.

Your obd't serv't,
CHATHAM.

ART. V.—*The System of Horizontal Ploughing defended, and the objections urged against it, by Messrs.* WILLIAM ELLISON *and* D. P. HILLHOUSE, *considered and replied to; by* ELDRED SIMKINS, Sen.

(Concluded from page 347.)

Mr. D. P. Hillhouse, of Washington, Geo. who I believe to be an excellent practical planter, in "the Outlines of his agricultural system," which he gives at page 121, in your last March number, seems to condemn the system of horizontal ploughing, where he says, (p. 123,) "Deep ploughing is very necessary, but I do not conceive that serpentine and zig-zag beds and water-furrows to be required. If the same watchfulness and care is observed in ploughing *flush* that is usually observed in *horizontal* ploughing, the same good would be effected, much labour saved in cultivating, and much risk of losing soil avoided. The falling rain descends upon no more than the surface which it measures in the air; and if it can rest where it alights, it is best. When ground is deep and *flush* ploughed, (that is, made mellow, with an uniform surface,) the water that falls upon it is imbibed, even to half the measure of its loose soil, as Mr. Herbemont's experiments demonstrates. But when the water falls upon convex beds, it is thrown off into the adjacent furrows, where it is desired to remain stagnant until *horizontally* and doubtfully, rather than *perpendicularly* and certainly imbibed. If one fourth, or only one fifth of the surface, be cast into evaporating troughs, and consequently without loose soil, then that position of the water privilege is lost."

I copy at full length Mr. Hillhouse's remarks on this point, that justice may be done him, as well as the subject. As this is the most formidable and direct attack I have seen made on horizontal ploughing, and the subject is one of undoubted importance to the public, I hope that part of your readers who are alone pleased with short pieces, will excuse the space I feel bound to occupy in examining it.

In the first place, I agree with the writer as to the utility of *deep* ploughing. Its use in giving full scope and nutriment to the roots of almost every kind of crop, in absorbing the rains which fall, and in mixing the lower earth with the upper soil, cannot be doubted by any judicious planter.

But will this do away with the utility of thrown-up beds, and water furrows, pursuing the level in hilly lands? It will strike the writer at once that it will not, *in all kinds of lands.* When he remembers that, perhaps, four out of five parts of the lands throughout the two States of Georgia and South-Carolina are thin, have but a slight soil, and for the most part will not bear that deep ploughing which would succeed admirably in Mr. Hillhouse's deep mulattoe and red soils. To plough very deeply on a thin soil, (though sometimes it may be advantageous, depending on the sub-soil and other circumstances,) yet in general, would throw up such a "caput mortuum," which, whilst it might go far to prevent washing, would, with still more certainty, prevent the production of a crop—would blast the planter's hopes; for although this "dead clay" thrown up by very deep ploughing might, in time, be operated upon by the atmosphere and one or two winter's freezing, so as to be improved, yet but few planters could afford to stand by and wait for this slow process.

I doubt whether Mr. H. has given "the zig-zag beds and water furrows" a fair trial, if any at all. If he has, it has been likely on his own peculiar rich tenacious soil, where deep ploughing would go far to answer all his purposes, for if I remember right, it is too tenacious as well as too level to wash much. It is no criterion for lands generally. But I think he has not made the experiment on *hilly lands*, because he says that by his system of deep *flush* ploughing, the same good would be effected, much labour saved in cultivation, and much risk of losing soil avoided.

First. Now would as much good be effected in his way as by ploughing on the level? My experience says the reverse of this is true, for mine is a light free soil, and by ploughing down hill, however deep, I am quite sure a gully would be made where the plough last run in the middle of every row, and in a very few years washing rains, would sweep away my soil. Let every man of experience on our common loose and free soil, who has pursued the old plan of ploughing, stand up and say whether his plantation has not been washed into innumerable gullies and ditches, and whether his soil has not been swept away. Indeed we need not travel a mile, in any inhabited direction, but what experience joins common reason and common sense, in declaring that the whole land has been ruined, principally from that cause. But will *deep*

ploughing prevent the evil? It may go far to do so in lands but little declining, and having a clayey tenacious soil, but in light, free and loose soils, the deeper the ploughing, at least till you get to the clay, the deeper will be the washes down the hill, and the more deplorable the injury. No matter how much pains you take, and how *flush* the ploughing, the last furrow in the row will be run somewhere, and wherever it is, will serve as a conductor to send off the soil. Whatever of soil is left in the middle, in the course of two or three years changes, all will be gone. Let us for a moment contrast this plan with skilful horizontal ploughing. Now the only possible danger of losing the soil on that plan, is by suffering the water to accumulate, and break over—that it will do this without care and skill, I frankly admit—with them, experience (the best of all things,) tells me it will very rarely.

Second—Is much labour saved in cultivating, according to Mr. Hillhouse? I imagine that some may be saved, because of the tediousness of short rows in the horizontal plan, which intervene at certain spaces, wherever the hill is unequal or irregular. But will any reflecting planter say that this, comparatively small extra labour, is to overbalance the loss of soil? I think not. To show that I am not alone in deeming the extra labour small, compared to the great good, but that I concede even more than others, I feel authorized to mention that my intelligent neighbour, Mr. Watts, who has appeared in your work, and who has tried both plans, thinks the extra labour caused by crooked and short rows, is fully balanced by the superior ease given to the man conducting, and the horse pulling the plough—always being on a level—not enduring the pain of descending, or the heavy labour of draging the plough up hills.

Third—But is much risk of losing soil avoided, as Mr. H. asserts? This cannot be the case, if my previous positions are true.

I grant that if the falling water by rains, can "rest where they alight, it is best," but I do not fully agree with Mr. H. in his ingenious play upon words, when he asserts that "when the water falls upon convex beds," (alluding to those thrown up by horizontal ploughing,) "it is thrown off into the adjacent furrows, where it is desired to remain stagnant until *horizontally* and doubtfully, rather than *perpendicu-*

larly and certainly imbibed." There are several errors in this hypothesis. In the first place, one would suppose from reading it, that these beds were of stone or wood, or at least of some hard substance, calculated to throw the falling rains off into the water furrows, without imbibing any of it. Now so far from this being the fact, these beds are as light as they can be, and from being thrown up, are necessarily as porous and mellow as any earth can be made, and therefore from being deeply broken up at bottom, (for there is no law against *deep* ploughing in the horizontal system, but every inducement to it,) drinks in an immense deal of the falling rain, and what escapes into the water furrows, is there safely deposited, not to stagnate, but to assure the planter that *there* it is, at least an innocent element; but if suffered to collect into a torrent, it is a dreadful enemy, sweeping away every thing before it.

Let me assure Mr. H. that the portion of water which may evaporate from the furrows, or evaporating troughs, as he calls them, will not lose half the water privilege that it would cause, in descending rapidly in the down-hill furrows.

The gentleman whose doctrines I have deemed it my duty thus incoherently to examine, will, at once, perceive that I have not done so in a spirit of anger, or even of unnecessary controversy, but for the sole purpose of arriving at the truth in a matter of very great moment to the public.

And now, Mr. Editor, I must tender you my acknowledgments for the kind manner in which you were pleased to receive, and to speak of the only communication which I have ever made to you. It gratified me to find that you quickly saw and appreciated the vital importance of the subject, to all the upper and middle countries and districts, in the Southern States. It is still more gratifying to state to the public, through you, that the additional experience I have had in horizontal ploughing, confirms still more strongly my first views and impressions of its usefulness.

Your's, respectfully,

ELDRED SIMKINS, Sen.

ART. VI.—*Account of an Experiment made with Salt, as a Manure for Green-seed or Upland Cotton; together with some Observations on the Culture of Cotton in new land; by* Mr. WM. ELLISON.

"Fairview, April 21st, 1830.

Dear Sir,—I now set down to redeem my promise made some time ago, on the subject of some experiments which I have been making in my agricultural operations. I should scarcely think some of them worth notice, and would trouble myself and the public but little about them, if you had not expressed a wish, on several occasions, to hear the result

The first I shall notice, is the application of salt to cotton. The land selected was light and thin, and had been some years in cultivation; the quantity applied, about a bushel and a half to the acre, in the drill. The cotton put on the appearance which has been remarked in the low country, on the application of salt, and when fresh; was somewhat dwarfish, and paler in colour than the rest in the same field; but bore somewhat more abundantly, and seemed to be about a week in advance of any on the plantations. Several persons who examined it with me, pronounced the staple of the cotton finer and more silky than the rest, and I thought so too. I had no means of keeping it when gathered, separate from the other cotton, so as to test it in the market. The land to which I applied the salt, required it less than any other that I planted, and it was not of course the most judiciously applied, as I found by experience.

With respect to the value of salt as a manure, the experience of one season only, is not sufficient to enable me to pronounce thereon with confidence; especially as men of science differ on the subject. There is scarely any thing more embarrassing to the novice in any pursuit, than the conflicting opinions of those who assume to be judges. Some would have us believe that salt in proper quantities, is the best manure that can be applied to land; others say it is of no use, or worse than nothing, when used alone. It is the same in many other subjects. A Davy will advise to plough in all manure as soon as possible, after spreading it on, and the greener the better; while a Hayward rejects that doctrine, and advises you to spread it on the surface, and leave it to the influence of the elements. The same difference of opinion will be found among practical

planters respecting the simplest agricultural practices. This difference of opinion among the scientific, and the indifferent success of some experimentalists, induce many who are unlearned to reject theory altogether, and adhere to some practical rules. Nothing can be more injudicious; for these very differences of opinion excite inquiry and afford exercise for the mind. Whoever supposes that one set of rules will invariably apply, will find himself mistaken; and, in fact, not one of the occupations of life require in a higher degree the union of science and practice, than agriculture. Let a chemist turn farmer, and he will at first think that all the common farmers of the country are fools, and know but little of their business. He will engage in his new pursuit with his assortment of principles, and may be well acquainted with all that human knowledge can teach of the theory of vegetation, of the evolvement of gasses and of chemical changes and combinations; and yet all his time may be spent in puerile and unproductive experiments and speculations, which may be only calculated to excite the ridicule of his neighbours. Let him, however, unite his science to a knowledge of practical details, and rural economy, and he may become a useful agriculturist. Nothing will show more forcibly the necessity of experiment and personal observation, than the failure of some of the rules of the most scientific men, in their indiscriminate application. Take, for instance, the opposite opinions of Davy and Hayward, and we will probably find neither invariably correct, and the experimenter will be obliged to think for himeslf, and be governed by climate and soil, and the objects in view.

In regard to the particular subject of this communication, (salt,) I shall not be influenced by the contradictory opinions of those who have written about it; I incline, however, to those who think it of no great service when used alone. I thought it of service in the experiment made by me the last year, but not so decidedly beneficial as to be an object. There are, doubtless, lands to which it may be beneficially applied alone—such as have an excess of undecomposed vegetable matter. The valuable qualities of salt-mud are too well attested to be doubted, and it must be indebted to salt for its superiority. Reasoning from analogy, I should suppose it might be beneficially applied to new land recently cleared, which usually produces abundance of wood and but little fruit; while manured land producing

wood equally luxuriant, yields fruit in abundance. It may be known to many, but perhaps not to all of your readers in the interior, that our fresh ridge lands of good quality and light soil, may be made to produce an abundant crop of cotton the first year, if planted early, (so early, in fact, as to be unseasonable on older lands,) and pushed, as it is usually called, or often worked in the early part of the year. Most persons plant such lands the latest, whereas they should be planted, if practicable, the earliest of any other in cultivation. But there is a portion of this kind of land in that state, called sour, and another, abounding too much with undecomposed vegetable matter to produce a profitable crop of cotton the first year, under ordinary treatment. Such lands are usually too open and spongy to lie close to the seed when planted, and they are consequently slow and irregular in vegetating and coming up. This unprofitable growth of the cotton plant may, I think, be ascribed to the constant and slow decomposition of the vegetable matter on the surface, during the heat of the ensuing summer, supplying it with continual excitement, until frost overtakes it, bending with its load of limbs and bolls, to the great disappointment of the cultivator, who perhaps made large calculations upon it. In addition to early planting, salt, would, I think, materially contribute to alter the process, and bring sooner into action the fertelizing properties of the vegetable matter.

I have heard some objection to stable manure, as an application to land in the cotton culture; alleging that it produces diseases, and sometimes too much wood. This is owing entirely to negligence and want of skill in distributing it; properly used, nothing can be better for upland cotton. If applied green, and in the drill, it produces the same effects as the crude matter of new lands; in such a state, Hayward's practice of spreading it on the surface, would probably be the best, and a certain portion of salt in combination, would, doubtless, be very beneficial. If well rotted, however, I think in moderate quantities in the drill, Davy's theory of covering is the best; for a warm southern sun would soon dry it, and reduce it to dust or hard lumps, which, with difficulty, crumble and mix with the soil.

To conclude what I have to say on the subject of salt, I will merely observe that I have not abandoned it, although I apply none of it the present year; but one of my neigh-

bours spoke some time ago of using some of it in new land, for the purpose of testing it. I have none such in cultivation. Those who live at some distance from water-carriage, will probably never use it in any way on their lands, and many of those who live near to water-carriage, may probably regard it as too dear, and it may never be extensively used, unless the price be considerably reduced. It might, however, be much more used than at present, in the formation of compost.

I feel somewhat tempted to say something in this article, on the subject of late ploughing in the cotton culture, a practice which is a subject of dispute among planters; but I have already drawn it out to considerable length, and will defer my observations to some future occasion.

WM. ELLISON.

ART. VII.—*On Manuring by Enclosing*; *by* PISUM.

Mr. Editor,—The experience of another year, and the results of another crop, on my plantation in Burke county, kept in heart by the system of manuring by enclosing, I recommended in your July number, may prove useful to some of your readers.

I have nothing new to communicate upon the subject, but do not doubt that this system, if adopted on the seaboard, in conjunction with the plan of manuring with marsh mud, sedge, &c. applied during the winter, broad-cast, and *ploughed* in with the vegetable coat in the autumn, would effect more than double the labour bestowed in the usual form of manuring and listing with the hoe. Its effect is to give uniformity to any given number of superficial feet of the field, by incorporating equally with the soil, the vegetable manure which such given space has produced, (and as much more as the planter in his bounty may add,) and by this equal distribution, preventing those sudden growths, occasioned by the roots of cotton coming in contact with *isolated* masses of manure, and the consequent exhaustion after the vessels shall have shot beyond their bounds. If the season becomes suddenly dry, this consequence will be very apparent; but even in ordinary years, it unfits the plant to

bear the common drought of the month of August. I cannot but ascribe some of the diseases of cotton to the system of listing and bedding; furnishing, as it does at best, in my opinion, rough fare for such a tender plant.

What is agriculture but gardening upon an extended scale? And what gardener could hope to succeed with no other instrument than his hoe? The plough is to the agriculturist what the spade is to the gardener. It is the only instrument by which, upon a large scale, the manure applied to the earth can be so incorporated with the soil, so as to produce a uniform and suitable pasture for the intended crop.

But I did not intend, at this time, occupying so much of your valuable magazine, having no other view when I commenced writing, than to state the product of my pine-land crop of 1829, which you and your readers might compare with that of the preceding year, reported in your July number, viz:—

In corn field No.	1,	30	acres product,	345	bushels.
"	2,	40	"	440	"
"	3,	40	"	649	"
"	4,	30	"	498	"
"	6,	45	"	339	"
Part of field	7,	18	"	105	"
Field	8,	24	"	160	"
"	9,	19	"	165	"
Part of field	10,	30	"	155	"
		276	acres produced,	2856	bushels of corn.

and 22 stacks of fodder. In cotton, 40 acres—product 17,300 lbs. in the seed.

A field of new ground, containing 42 acres, was taken in, and planted in corn, and cured, stalk, ear and blade, in an immature state for forage, together with four pens of pea vines, in the manner heretofore recommended by me.

The manure from all sources, as formerly was applied to fields Nos. 3 and 4.

Permit me to correct an error of mine in my communication, (vol. ii. page 318,) of your magazine. The last sentence of that page should commence: *Eighteen in field No. 7, and about 20 acres in No. 6, &c.*

PISUM.

Savannah, April 1, 1830.

ART. VII.—*Account of an Experiment instituted for the purpose of testing the value of the native breed of Cattle, for giving Milk; by* ARATOR.

Mr. Editor,—My fondness for good milk and butter, and a desire to know what improvement might be made on degenerated cows by a proper course of treatment, induced me, the last winter, to an experiment with eight cows; an account of which I will now give you, in the hope that some of your readers may be stimulated to improve on it, and that it may in some degree be useful.

I erected a house for the exclusive use of these cows, and partitioned off eight stalls in it, four on each side, and between the ranges of stalls a sink was made as a receptacle for the dung and urine. A trough was placed to each range of stalls, to hold the food. My cows, with the exception of one of them, (which is of the short horn beef blood,) are of a degenerated stock, occasioned by that sort of neglect which has long been common in this part of the country; they were poor at the time they were put up, and the whole of them at the time did not give five quarts of milk at a milking. Their food, for some weeks after they were put up, was composed of a mixture of cut sugar-cane blades, oat straw and shucks, cotton-seed, and wheat bran, all boiled together, with a little salt added to the mixture. After the stock of bran was exhausted, the other ingredients were continued with an addition of pot ale, from a whiskey distillery; boiling the food was discontinued at this time. From a period of three weeks after the cows were put up, till recently, the whole of them together, gave generally the rise of forty-eights quarts of milk each day; and twelve quarts per day was frequently taken from a choice one of them. How much butter was yielded, is not known, but my good wife tells me that considerable addition has been made to her pin-money stock, by the sale of butter to our neighbours, several of whom have been supplied by her.

The curry-comb was used morning and evening on the cows, and the dung and wet litter were removed from under them into a receptacle every morning, and a new bed of dry leaves from the woods, placed under them.

For the trouble I have had with this small experiment, and the food consumed in it, I have had ample compensa-

Reproduced from poor material

tion, not only from the butter, as already stated, but also from the quantity of milk it enabled me to give my negroes, and a large quantity of manure for the improvement of my land.

ARATOR.

Georgia, 2d April, 1830.

ART. VIII.—*On Plantation Gardens, and the Culture of Vegetables; by the* EDITOR.

Independent of the ground allotted for the garden of the proprietor, there should be attached to every plantation, a piece sufficiently large to grow such quantities of the more common vegetables on, as may supply the wants of each slave on the place. By pursuing this plan, their health will be improved and their condition bettered, inasmuch as their diet may be more varied than it now generally is. But little attention, if any, has been paid to this subject by our planters, owing in some measure to its never having been presented before them, and partly to a supposed difficulty in the rearing of vegetables, and perhaps to a want of proper instructions on the subject. But the management of gardens, such as we would wish to see established on every plantation, would not be attended with so much difficulty, or require as much labour as the private gardens of individuals; in the latter, the appearance of every part must be regarded, and they must be kept in excellent order, that they may be both productive and pleasing to the eye of visitors. This need not be attended to in the plantation garden. The vegetables we would cultivate here, should be those that are common, and the greatest number of these may be attended principally with the cultivator or plough. Here the appearance of the ground will not be regarded farther than it may be necessary for the better culture of the crops. The product alone should be deemed worthy of attention.

The establishment of these gardens may be objected to on the plea—first, that it would be substracting from the productive labour of the estate, that is, from that part from which our income is derived; and, secondly, that each slave

has ample time and sufficient ground to raise as large a quantity of vegetables as he can desire; and that generally he has every facility offered him for effecting this. To the first we reply, that the labour required will take but little from the effective force of the plantation, as it may principally be carried on by half hands and children, with the assistance of the plough and cultivator. To the second, that the indolent nature of negroes, so well known to us, and the experience of our whole lives, forbid us to expect that they will ever be induced to undertake the least work which does not result in their immediate benefit, without coercion, for, of all beings, the negro appears to be the most indolent and the most improvident. Should, therefore, this objection be deemed of sufficient weight, yet there are two plans by which what we propose may be effected. The first is to attach a small garden to each cottage, and compel the inhabitants to keep it in order, and to sow, plant and transplant the various vegetables as they come into season; and in this they should be governed by the gardener of the plantation, who should have it in charge to supply such seeds as each required, (all of which, with a very few exceptions, may be raised on the plantation,) and to raise a supply of cabbages, tomatoes, peppers, and other plants, as will be equal to the demand for them; and also to instruct such as are ignorant, in the proper method of cultivating each vegetable and the best mode of doing it. This last duty would, in all probability, cease after the first or second year. Nor would it be a great addition to the labour of the overseer, if he were instructed by the proprietor, that he should see that each one kept his garden in good order, and followed the directions given by the gardener as to the time proper for the execution of each work. The quantity of manure which would be required, may appear at first to be an obstacle of considerable magnitude, but compost manures generally answer better for vegetables than either animal or vegetable, alone; and if each would only be careful in collecting all the manure that he could from his hen-house and hog-pen, and mix these in small quantities with mud from the swamp, or the rich top soil from the woods; and if he lives near to the sea-board, either add a little of the salt-mud, or sprinkle the whole over with salt water, he would possess enough, and of the richest quality—moreover, he could add to this, all the ashes from his hearth, together with

the sweeping of his house, and all the slop and filth which usually accumulate around a negro's dwelling. The second plan that we offer is, that a large garden be laid off, and placed under the superintendance of one intelligent negro, and that every slave be compelled to work a certain number of hours, *each week* in it, under the direction of the head gardener. Perhaps it would not require an average of more than a half, or at most, an hour's work from each hand, per day, and the increased comfort not only of himself, but of his family, would surely compensate him. This, perhaps, is the more eligible plan of the two, and we will proceed to give such instructions as will enable the planter either to carry it into execution in this way, or, (as we would prefer,) by persons allotted for this special work. And here we would premise, that in the directions we shall give, it will be our object to economize, time labour, and manure; and that, consequently, the operations carried on according to these, will not have the neat appearance which we are accustomed to associate with a garden. The greatest product with the least labour, will be the object we shall aim at, and although the directions we may give may differ materially from those we have been accustomed to, and appear extremely slovenly in practice, yet what we shall state, shall be the result of actual experience.

We would select for a garden, a light loam, and if possible, a part of the garden should embrace a portion of low ground, well drained, which will be highly useful for cultivating all of our summer crops on, and will be almost absolutely necessary for one or two of the vegetables we propose rearing. Its form should be either a square or an oblong, as these afford more facilities for using the plough than any other—this is of importance, as we intend making free use of this instrument in all of our operations. Having selected the spot, it should be enclosed by a substantial fence or hedge: the latter is preferable, and if the nondescript be used, it will soon afford protection to it, from the depredations not only of animals, but also of the negroes of the plantation, who very often have strong propensities to give freely to their acquaintances of the neighbouring plantations, what belongs to their master. The area should be divided into squares by paths of eight feet in width. These paths will be necessary for the introduction of the

carts with manure, as well as to carry off the product and the offal. The squares ought not to be less than one fourth of an acre, for if they be small, there will be much loss of time in turning so frequently, as will be necessary, when using the plough. If the whole space be small, it will be as well to divide it into two equal divisions, by a road through the centre, and plant the vegetables across these, in contiguous rows. As to manuring, it will always be best to spread the whole over the surface, (especially if it be long,) and plough it under; but this will require a larger quantity than will be necessary, if used in drills, on which the vegetables are to be planted. Having laid out the ground, the next step will be to prepare it for receiving the various crops, and for this purpose, as large a plough as can be had on the plantation, should be used, and with this the ground should be broken up as deep as possible, and afterwards made fine with the harrow. It may require several workings before it is brought to this state, but these must be given now, as it will render the future workings more easy; and it must be borne in mind, that for all vegetables the ground should be well pulverized, and for many that it should be done very deep. We will endeavour, as much as possible, to give the culture of each in the order in which they will be required from this time. We will commence with the cabbage, as it is in such general repute, and as this is the season when it should be attended to. Before proceeding in our directions, we would observe that the neighbourhood of Charleston is intended, when any date is given, as to the proper time for executing any operation.

Cabbages.

For these a seed-bed should be prepared. The ground should be well manured, broken up, and made as fine as possible. It should then be divided into small beds of four feet width, which will give much facility for weeding the young plants; across these, drills should be drawn about an inch deep and three inches apart, into which the seeds should be scattered very evenly and *thin*. Most persons err in sowing these too thick, in consequence of which the plants are drawn up, and become feeble; and if the transplantation be long delayed, many of the plants are lost, especially if it be in summer. In the spring of the year and the autumn, the seed bed will need no protection, but during the summer months,

unless this be afforded them, the germinating qualities of the seeds, however good, will be destroyed by the sun, and even if, from a combination of favourable circumstances, they should germinate and come through, they will be very liable to be killed. The best mode of protecting them, with which we are acquainted, is to make a slight scaffold over them, about three feet high, and on this to spread a number of green bushes, sufficient to shade the ground completely. The density of this shade will continue as long as needed, which will be during the germination of the seeds. All plants, as soon as they are up, require heat and light; the first will be abundantly afforded by the temperature of the soil and atmospere, without the direct influence of the sun, which, as we before stated, would prove at this time injurious. The height of the scaffolding will permit a sufficient quantity of reflected light to pass to the young plants, and as they advance in their growth, and require more of both of these, the demand will be answered by the falling of the leaves from the branches used as a covering—thus, gradually affording as much heat and light as they require, until the whole having fallen, the plants are exposed to the rays of the sun—a few dried branches alone intervening, which may, or may not be taken away. The seeds for such plants as may be required in spring, ought to be sown late in autumn; should this not be done from any cause, they may be sown during the winter; but they run much hazard of being killed during some of the cold spells, especially when very young. A scaffolding should therefore be erected over them, but nothing placed thereon. Hay, straw, or even green bushes, should be provided, and on the approach of cold weather, they should be thrown on the scaffold, which ought not to be more than eighteen inches high; this should be removed on the recurrence of mild weather. The plan of protecting them by throwing the straw, &c. over the plants, is bad; as, in the first place, this is not always effectual; and, secondly, very many of the plants are destroyed by it. The sowing of the seed should take place six weeks or two months previous to the time intended for setting them out, as they will take fully that to reach a proper size.

The varieties commonly grown among us, are, the Early York, Sugar-loaf, Battersea, Green-glazed, and Drum-head, which mature in the order in which they are here named. These are all excellent, but we would prefer the three last

for the plantation garden. Although cabbages can be had at all seasons of the year with us; yet they are in their greatest perfection during the winter, those grown for summer use, are generally very indifferent, and scarcely repay the trouble of raising them. For the winter, the Battersea and Drum-head should be chosen, but for the *late* spring, summer, and *early* autumn crops, the green-glazed variety only, can be used with advantage. At those seasons of the year cabbages are subject to the destructive depredations of worms which prey upon their leaves, and render the whole plant unfit for use. The Green-glazed cabbage, from some cause or other, is entirely exempt from this, and forms a strong contrast, exhibiting its large broad leaves entire, while those of every other variety are completely riddled, and more resemble honey combs than leaves. But this variety is coarse, and not to be recommended when the others are to be had. We therefore suggest the propriety of sowing the Green-glazed cabbage-seeds in February, March, April, May, June and July, and transplanting them as soon as they are large enough. They will be fit for use in the months of July, August, September and October, and will continue good during the winter if not used. During all of the other months, the Battersea and Drum-head should be sown. The seeds sown in September and October, which will be for the first spring crop, ought to be from Europe—those of American growth will send out seed stalks early in the spring, sometimes without heading, whilst those from English seeds, will cabbage, and remain firm. Those intended for summer and autumn use, should be from American seeds, as plants raised from European, cannot at those periods withstand the heat of our climate.

The preparation of the ground for the crop, next demands our attention. It should be ploughed and harrowed, until it is brought into a fine tilth; let the plough then lay off furrows three feet apart, and as deep as can be done by the plough passing twice through each; into this the manure should be spread, in considerable quantities, as the cabbage can scarcely be manured too highly, and well repays the quantity allowed it. Animal manures are undoubtedly the best; but we have used a compost made of animal manure and marsh-mud, with very great effect, and the cabbages were superior to those where the mud had not been used. After the manure has been spread, the plough

should return and cover it, by throwing a furrow on each side. If it is intended to cultivate them in ridglets, they may be left in this state, but if a level surface be prefered, the harrow should be passed over the tops lightly, taking care not to disturb the manure buried beneath. The plants should now be removed from the seed-beds, (selecting the largest,) and transplanted on these rows, at the distance of from two to three feet apart—this distance must be regulated by the variety and the richness of the soil, or quantity of manure used. Should the earth be dry, water should be poured into the holes where the plants are to be set, which is better than watering them after they are planted out. Except during the winter, they should be shaded until they have taken root, by sticking a bush to the south of them. The after culture consists in keeping the ground very loose and clear of weeds; if they have been planted on ridglets, they may be worked by the plough, which should run as near the plants as possible, throwing the earth from them; it should then immediately return it to them, which will leave the ground in a very loose state—near to, and between the plants on the ridglets, the hoe must be used. If the plants have been set out on a level surface, the cultivator may be used with great success, and if two of the tines only be used at first, they may be run very near, so as to leave but little work for the hoe to do. These workings may be repeated whenever it is thought the plants require it. At each ploughing a little additional earth should be thrown to the sides of the ridglet; and the oftener these workings are repeated the better, as few plants will so well repay this frequency of work. The Early York, will require at least two months from the time they are transplanted, before any of them will head. The Battersea and Sugar-loaf, about a fortnight more, and the Drum-head about three months. This knowledge enables us to judge of the proper time for setting out each, which should be the length of time above stated, prior to the time they are wanted. For a winter crop, it is best to sow the seeds *on poor ground*, in April, and let them there remain until the months of July and August—they will be much hardier plants than those raised from seeds sown in June and July. The most eligible months for transplanting cabbages, are July and August for winter, October and November for early spring, and March for late spring crops.

(To be continued.)

PART II.

SELECTIONS.

Art. I.—*On the Natural History of the Honey Bee, and on the Importance of its Products.*

[From the North-American Review.]

(Continued from page 375.)

Straw hives are unsuitable for our climate, and afford a harbour for all kinds of insects. It is folly to talk of their cheapness. If a man intend to keep bees, he must in the first place, make the hives in the very best manner; by this we mean of good materials and good workmanship. A hive badly joined by an awkward carpenter is worse than a hollow tree. One half of the labour of the bees, is directed to the repairs of their dwelling. It is not asserted that bees will of themselves, fall into these hives, or that no trouble or expense is necessary in the management of an apiary. We know that both care and expense are required; but the latter, after the first disbursement, is very trifling. Vigilance and neatness are forever in requisition, and the care of bees like all other profitable business, cannot be pursued to any advantage, unless it receives daily and minute attention. But have we not accomplished a great deal when we have reduced the thing to this certainty?

But although, as we have before observed, nothing is more simple in theory and practice, than the history and care of bees, yet it requires a constant and unremitted attention if we aim at the instruction or profit. Can any thing be well done and to advantage without these? Varro, in his treatise, *de Re Rustica*, is the first who has spoken of *hives*. He wrote upwards of 1780 years ago; and how many different sorts of hives have been constructed since his time, to say nothing of the different theories? We wish to see bees in every garden throughout America, but we have no desire to see the subject encumbered more than is necessary to advance the pleasure and profit of the pursuit. To the naturalists we will leave discussions of organization and pro-

pagation. They are foreign to our purpose, as they only serve to perplex and deter us from the main points. But it is proper to know the most simple mode of managing a hive, and this includes the pasture or food that is necessary for its sustenance. Hunger destroys as many bees as the millers. We ought to cultivate such shrubs and plants as the bees like; without this they will starve. The American black willow and the red maple are the first trees that are visited by the bees. They are fond of the crocus, which is the earliest of the bulbous roots; and these we can have in abundance, as they multiply quickly and occupy but little space. They are beautiful in themselves, affording a rich treat to the eyes; and they flower so early, and are of such bright and vivid colours, that we take as much pleasure in them as the bees do. The stercorary and piggery are next resorted to by these insects. These we presume are their medicine shops, and the extract absorbed from them must be used as a tonic. Blossoms of all kinds, except those of the red clover and of the honey-suckle are excellent food; and the bees especially profit by the increased attention bestowed at present on the cultivation of the peach tree in some parts of the country. They not only drink the nectar and extract the pollen of the flower, but they appropriate the peach itself. We have seen twenty or thirty bees devour a peach in half an hour: that is, they carried the juices of it to their cells. The humming bird alone can reach the bottom of the nectary of the honey-suckle, but even here the instinct of the bee is seen. The small birds, such as the wren, make an incision on the outside, near the bottom of the flower, and extract a part of the juices. The bee takes advantage of this opening and avails itself of what is left.

The scent of the bees is so acute, that every flower which has a powerful odour can be discovered by them at a great distance. Strawberry blossoms, mignonette, wild and garden thyme, herbs of all kinds, apple, plum, cherry, and above all, raspberry blossoms and white clover are delicious food for them, and a thriving orchard, garden, and apiary fitly go together.

But as the bee seeks only its own gratification in procuring honey and in regulating its household, and as, according to the old proverb, what is one man's meat is another's poison, it sometimes carries honey to its cell, which is prejudicial to us. Dr. Barton, in the fifth volume of the American Philosophical Transactions, speaks of several plants that yield a poisonous syrup, of which the bees partake without injury, but which has been fatal to man. He has enumerated some of these plants, which ought to be destroyed wherever they are seen;—namely, dwarf laurel, great laurel, kalmia latifolia, broad-leaved moorwort, Pennsylvania mountain laurel, wild honey-suckle, (the bees as we have observed cannot get much of this) and the stramonium

or Jamestown weed; which last we should wish to see completely eradicated, as independently of the poison, extracted from its flowers, and from its seeds which are often eaten by children, it is the ugliest weed that grows, and has the most offensive odour.

The poets, always exalting and magnifying the subjects that they touch, have contributed, perhaps, more than any other set of writers to mislead our judgment. They endow the bee with memory, and Rogers thinks that it finds its way to the hive by this faculty alone. Nor is it only with regard to the bee, that poets, the worst entomologists in the world have lead us astray.

Cowper says,

> "I would not enter on my list of friends
> Though grac'd with polish'd manners and fine sense,
> ——————————— the man
> Who needlessly sets foot upon a worm."

By *worm*, we wonder if he included the grub-worm. Alas! little did that amiable man think of the mischief that would ensue from this sensibility and tenderness towards insects. He thought that when nature created them, and designed them an abode, that it was a species of cruelty to hunt or harm them, when not actually crawling "in the alcove, the chamber, or refectory." But the harm that the few do, which so inadvertently approach our dwellings, is insignificant when compared to the ravages of every kind of insect excepting the bee when in the abode that nature assigned it.* This very worm, from which they bid us turn aside when we meet it in our path, after destroying the roots of our pasture and our corn, becomes a winged insect, and continues its mischief to the destruction of our finest fruits.

We really are in a sad plight between our sensibilities and our sense of justice to ourselves. We say that insects have so multiplied, that we can neither raise grain for our cattle, nor fruit for ourselves. "Keep the birds near you," say the philosophers—"quit the cruel practice of shooting the harmless songsters of the grove, and you will not only be rewarded by seeing that insects decrease, but you will be charmed by their melody." But then we say in answer that the birds do not discriminate; that they prefer bees to every other insect, and therefore the birds must die. And in reality we must make war upon those birds, that show the greatest fondness for our little friends. Let us, at least, show our sense of the value of these, by keeping their enemies away, at any rate from their very doors. Let us lessen the chance of their encountering them abroad, by planting the favourite food of the bees as near the apiary as possible; and

* Other insects, however, beside the bee, are very useful to man. Among the number are the Cochineal insect, the fly which gives birth to the gall-nut, the silk-worm, &c. &c.

also lessen the chance of their being drowned when driven by high winds, as they stoop to drink, by giving them running streams near to their hives. * * *

In the hive of a new swarm, during the months of July and August, there are fewer small bees, than in one that has been tenanted for four or five years. The bee, like all other insects, spins itself a covering before it becomes a fly. When it emerges with wings from its cell, several older bees approach it, feed it with the contents of their stomachs, and then clean out the cell and deposit in it fresh honey. This is their constant practice; and the bee that is just born, as soon as it has been fed and has stretched its wings, flies off to a flower, and commences its labours. But although the bees clean out the cell the moment a young bee is born, yet they either find no inconvenience from that part of the film, which the young bee leaves at the bottom of the cell, (and which is of a silky nature,) or they are unable to detach it. In consequence of this the cell is not so deep, and as the same circumstances occur perpetually, brood alternating with honey, the cells become every year visibly smaller; and, consequently, those bees that are bred in these small cells, of which there is a great number, are never of the full size of those that have had more room. Even the queen eggs, which *we* say are often deposited in the cells of neuters, and have afterwards larger cells attached to the first, never produce so large a queen bee, as if the cell had been of the proper dimensions at first. Thus we see that the contraction of the cell may diminish the size of a bee, even to the extinction of life, just as the contraction of a Chinese shoe reduces the foot even to uselessness; but in neither case will a single new organ be taken from or added to the bee, or a single toe be taken from or added to the foot, whether the cell or shoe be larger or smaller.

(To be concluded in our next.)

Art. II.—*Culture of Silk—Reeling, Twisting, &c.*

[FROM THE BALTIMORE GAZETTE.]

(Concluded from page 381.)

According to the arrangement I have adopted, the direction for preserving cocoons should have been given in the last number, but were omitted in consequence of the length of that essay.

After clearing the cocoons of the loose *tow*, such as are intended for reeling, and cannot be wound off immediately, must be subjected to some process by which the chrysalis will be killed, to prevent its perforating the cocoon. Heat is most commonly ap-

plied. In Europe the modes of its application are various. Some *bake* the cocoons in an oven about half heated for bread; others apply steam, and others expose them to the rays of the sun for several days during the heat of the day. There is danger of scorching the silk in the first mode; of discomposing the fibres in the second; and of not perfectly accomplishing the object in the third. I have found the following mode preferable to any other, as the object is perfectly effected without danger to the silk. I put the cocoons into a tight tin vessel, with a cover closely fitted; and put this vessel into another a little larger, containing such quantity of water as will nearly fill it when the other is put into it; fire is then applied and the water kept boiling half an hour, or more, according to the size of the vessel, and until the cocoons in the inner vessel shall have become as hot as the boiling water. The cocoons are then spread out in a dry room, that whatever moisture there may be, may evaporate. By this mode the heat can never be raised so high as to injure the silk, and the fibre is not loosened by moisture; on the contrary, much of the natural moisture of the cocoon is dispersed. After this operation, the cocoons are ready for the reel or for sale. All the cocoons that can be reeled in the course of the first week after they are taken from the brush, may be reeled without this operation; and a considerable advantage is gained by thus reeling them, as they unwind much easier than when they have been heated. Cocoons intended for sale, or keeping on hand for future reeling, must be secured against mice and roaches.

To reel the cocoons, is considered the most difficult part of the duties of a domestic silk cultivator. On the first attempt, the reeler is ready to give it up as too difficult and tedious for his skill and patience. It is at this point where all who give up the business stop; thousands of persons in this country have gone thus far, and after a short trial, abandoned the culture of silk in despair. But the difficulty of reeling silk is only in appearance; it is easily overcome, and only requires a little patient perseverance. The extreme delicacy of the fibres, seem to defy the skill of the young reeler to handle and wind them without breaking; and even if he could wind them off, they appear so light and insignificant as to be unworthy of the trouble—he does not recollect that they are like fine particles of gold, and equally reward the patient gleaner. Let the young reeler summon all his patience, and set down to his basin of cocoons with a determination to succeed. Let him not try to make the best silk at first, but to become expert in catching the ends of fibres, and in clearing them from loose silk floating among the cocoons, in combining them, and ascertaining that they will unwind. If he wastes a few pounds of cocoons in this way, it will be no great loss. In a short time he will be able to reel equal to the most expert Piedmontese. Let me, therefore, urge the young silk cultivator to

try the experiment before he gives up. A few days, or even weeks, and a few pounds of cocoons, are trifling sacrifices for so great a reward as awaits his success.

These essays are intended of course for the instruction of farmers and others, to enable them to make silk in a *domestic and small way*, and by no means for large establishments, the proprietors of which will not need my aid. But whether it be on a large or small scale, the reeling, to produce good silk, must be done in the same way and with the same reel. Therefore it will be necessary that the family that undertakes the making of silk, should be provided with a proper reel, and on the Piedmontese principle, which will cost from twelve to twenty dollars. Reels of the proper kind can be obtained in Philadelphia for $12.— Good silk, it is true, can be made with the common cotton reel, but it requires great care, and frequent taking off of the skein, as well as other precautions and troubles, which are avoided by the Piedmontese reel. It is necessary that the threads should be crossed on the bars of the reel to prevent their gluing into a mass and thus becoming worthless; also that two threads should be reeled at the same time, and wound round each other several times between the basin and the reel, which makes the thread round and firm. All this is effected by the Piedmontese reel, but cannot be by any other, not on the same principle. I have constructed a reel, which works exactly upon the principle of the Piedmontese, but is more simple in its parts, and works equally as well. With either of these reels an expert hand can reel a pound of raw silk a day with ease.

A handful of cocoons having been cleared of all the loose silk and ends, is to be put into a basin provided for the purpose near the reel, which is kept nearly full of hot water. This basin may be set on a small earthen furnace over a few live coals to keep it of the proper heat. The common cooking furnaces are well calculated for the purpose. With a small wisp of clean broom-corn the cocoons must be stirred about till the fibres of the cocoons are observed attached to the straw; they are then to be taken in the hand, drawn through the fingers to clear them of motes and loose fibres, and drawn out till they are found to run well, when they are to be passed through the eye of the plate on the reel, and handed to the girl who turns the reel; another thread is to be obtained in the same way, passed through the other eye of the plate and handed to the girl, she then passes these several times round each other like twisting two strings, and separates the ends, passes them through the eyes of the wires on the traversing bar, and attaches them to the reel. The reel is then set in motion, and the attendant at the basin begins to catch the fibres of other cocoons and attach them to the threads alternately, by dexterously throwing the end on the thread as it passes up, to keep the size of the thread equal, for the first set of fibres will be

reduced in number and size by breaking and exhausting of cocoons, and must thus be continually replenished. The basin must be kept supplied with cocoons, but in such order that none will have been in the water over ten or fifteen minutes; and the water must be kept of an equable temperature; for if it be too hot, the silk will run off in clusters, and thus become knotty; if too cool the cocoons will be drawn out of the water and the fibres broken—when either of these occur, it is a sign that the water is too hot or too cold, and the remedy must be applied by adding a little cold water and reducing the fire in the first, or boiling water, and increasing the fire in the second. Generally the water is required to be from 150° to 175° of temperature; but never boiling. The most common size of thread, is twenty fibres; for very fine stuffs five fibres are reeled, and even single fibres for some. Let those who learn to reel, however, begin with twenty or thirty, or even fifty, which will be proper for coach-lace floss—the most profitable kind for American cultivators for some years to come—and for sewing silk. After learning to reel coarse silk with facility, it will be easy to learn to reel the finer qualities. From the beginning, however, let the young reeler attend strictly to certain rules and precautions, viz: whatever be the number of fibres he begins with, let him keep that number steadily in the thread, that it may be uniform and even; change the water as often as it becomes foul, and always use perfectly clear rain or river water, letting it stand for a time before use, that the sand, if any be in it, may settle before putting it into the basin—he will scarcely be able to reel silk with well or spring water that is *hard;* and generally, let him pay strict attention to *neatness*, avoiding the slightest degree of slovenliness, even though he do not reel so much in a day. These precautions will add to the value of the silk, and the reeler will soon become habituated to their observance. Let him also bear in con tinual remembrance, that the value of silk is enhanced or depreciated by good or bad reeling very materially. A pound of raw silk may be made, by care and attention in reeling, worth $8; but by careless slovenly reeling it will be reduced to 3 or $4 a pound; and when it is considered that a pound of the best reeled silk is only a day's work, and that the same quantity of poor silk cannot be reeled in much less time, the care and attention necessary to make the best will be richly compensated.

When moderate sized skeins are wound on, the reel may be taken from the frame, the silk smoothed over with the hand, and set aside to dry; after which it may be wound into bobbins, doubling it to make the thread as large as is required. If for carriage lace floss, and twenty-five fibres have been reeled, two threads may be combined, which will make a fifty fibre thread, a very good size for it. From the bobbins it may be twisted on a common spinning wheel, when a *throwster* is not at hand. For

carriage-lace floss, it should be very partially twisted. For sewing silk, the same operation is necessary, except that it will require a second doubling; three of the threads for carriage-lace floss wil make very fine sewing silk—they should of course be twisted more than for floss. For both floss and sewing silk, after the first partial twisting, the skeins must be folded short, by taking one or two turns as in preparing skeins of common yarn for dying, put into some perfectly clear rain or river water, in which a quarter of a pound of good soap to the gallon has been dissolved, and *simmered over a fire* three or four hours, or till the silk is perfectly freed of its gum and becomes white. It must then be taken out, rinsed in hot rain or river water, and then in cold water, in which operation great care must be observed to dip it gently, that the silk may not get tangled. It may then be hung up to dry, after which it may be doubled and twisted for sewing silk, or put up for floss. The silk should never be put up in large skeins, especially floss, as it is apt to tangle. One hundred threads is a good size. If the whole work has been properly done, the silk will be beautifully white, with a rich gloss, and if carriage-lace floss, it will be worth $10 a pound.

There is always a considerable quantity of waste silk, perforated, and imperfect cocoons. All this is easily converted to some useful purpose. The cocoons may be cut open, the dry shell of the chrysalis taken out, and together with all other waste silk, put into the water and the gum extracted. It is then to be rinsed, dried, picked fine, carded and spun, like flax-tow, and makes most beautiful and durable stockings, mits, gloves, &c.

I have now brought these essays to a conclusion—they are intended for the practical instruction of persons who may wish to enter upon the culture of silk, and many new and valuable improvements calculated to simplify the art, and to be found in no other written work, being entirely my own, will be found in them. If they shall be of any service either to the public or individuals, I shall be amply compensated for writing them.

GIDEON B. SMITH.

Art. III.—*Hay-Making.*

[FROM DEAN'S NEW-ENGLAND FARMER.]

The first thing to be considered about hay-making, is the time of cutting the grass. It should not be cut too early, or before it has got its growth, for this will cause it to shrink too much in drying. On the contrary, it should not stand too late, or till the seed be quite ripe. It is not only harder to cut, but the ripeness of the seed will cause it to scatter out while drying, which will be a considerable loss, as the seed is the most rich and nourishing

part; and the soil will be the more exhausted by nourishing the seed till it come to maturity, and the next succeeding crop will be the poorer. There never can be any advantage in mowing late, unless it be thickening the grass roots, by scattering some of the seed, where they were before too thin. He that mows early has the advantage of longer days for drying his hay; and of shorter nights, when the dews are less detrimental to hay-making.

But the farmer who has many acres of the same kind of grass, cannot always expect to cut the whole of it in exactly the right season. That he may approach as near to right as possible, he should cut the thickest grass first of all; especially if it be in danger of lodging, or so thick that the lowest leaves perish, or the bottoms of the stalks turn yellow. The thinnest of his grass should be cut next, which is apt to be ripe soonest: and last of all, the middling sized grass, or that which is on a medium between thick and thin.

Where a second crop is expected the same year, thick grass should be cut a little the earlier, that the roots may not be injured so much as to prevent their speedy recovery, by being closely covered too long by the first crop.

Some regard should be had to the weather, when the time of cutting is in contemplation. Those, especially, should regard it who are able to call in as much assistance as they please in hay-making.

Grass, which has not been washed with rain for several days, has a kind of gum on it, which is known by its adhering to the scythe. This gum is thought to be a benefit to the hay; and the farmers are fond of mowing their grass when this gum appears, rather than just after the grass has been washed by rain.

As to the drying of hay, or the manner of making it, I know there are a variety of opinions. The right way is to do it in such a manner that as much of the sap as possible may be retained, and in the best state that is possible. In this I think all would agree. All persons will allow that too much drying is hurtful. It is certainly a loss to rake it, or stir it at all, when it is so dry that the leaves will crumble. And doubtless as much of the sap should be retained as is consistent with its being kept in good order for fodder, and for long keeping.

Some grasses will keep well with less drying than is needful for others. The Rhode-Island bent, as it is called, or red-top grass, will do with less drying than some other grasses. It has been much practised to put up with so little drying that it heats in the mow to so great a degree, as to make it turn brown like tobacco; and it is known that cattle will eat it well, and thrive on it. But the mow will certainly send out part of the virtue of hay in steam. I cannot but think that all grasses should be so much dried, that the mows and stacks, though they have a degree of heat, should not emit any sensible steam; and I would

not wish to have hay made brown by mow-burning. It surely does not appear to so good advantage at market.

Were it not for the labour and cost, a good way of hay-making would be, for the hay-makers to follow at the heels of the mowers, at least as soon as the dew is off, and spread the swarths evenly; turn the grass about the middle of the same day; make it up into cocks before night; open the hay and turn it the next day; and so on till it be sufficiently dried, doubling the cocks if signs of rain appear. It will not commonly take more than two or three days to dry it, unless it be very green, or uncommonly thick or rank. A person who has but little hay to make, need not be much blamed, if he do it in this way; especially if the weather do not appear to be settled.

The practice of the best English, Flemish, and French farmers, is to expose the hay as little as possible to the sun. It is carried in dry, but it preserves its green colour; and you see hay two or three years old in their market, of so bright a green colour, that we should scarcely conceive it to be cured. Yet they are in the practice of preserving it for years, and value it more for its age. If such a course be best in climates so cool and cloudy, how much more important would it be under our scorching summer suns?

But if the weather be unsettled, or if showers be frequent, it may be better to spread grass well, as soon as it is mowed, stir it often, cock it the same day it is mowed, open it in the next fair day when the dew is off, let it sweat a little in cock, and house it as soon as it is dry enough. It will bear to be laid greener on a scaffold, than in a ground mow; and in a narrow mow greener than in a broad one. And that which is least of all made, should be put upon a scaffold.—*Deane.*

Art. IV.—*On Topping the Stalks of Indian Corn.*

[from the new-england farmer.]

Indian corn, when all its uses are considered, is the most valuble product of our cultivation. On this account, the best mode of raising and managing it must be an interesting subject of inquiry to every farmer. In no crop cultivated among us have greater advances been made; since where twenty-five bushels of corn to the acre were formerly considered as the average crop, fifty are not now uncommon; one hundred are sometimes produced, and even in old Massachusetts, we learn from the Plymouth county agricultural reports, one hundred and thirty-six bushels have been raised. The point which I now wish to pro-

pose to the consideration of farmers, and upon which I hope to obtain through the medium of your excellent paper, the judgment and experiments of the intelligent and observing, is this: What is the effect upon the crop from the practice of topping the stalks or stripping the blades of corn? I shall refrain from giving my own opinion in the case, but shall quote some authorities and statements, which certainly have weight; and which with many will be deemed decisive.

In a late tour through a neighbouring county to visit some farms proposed for premiums, to which the committee of the county society did me the honour to invite me, in examining the farm of a gentleman, who was the last year a successful competitor, the subject came under discussion in a field, where a part of the corn had been topped early in August, and another part had been recently topped. This was the 8th September. The farmer himself, upon being questioned before examination as to the expediency of early topping, answered, that in his opinion it was not injurious to the crop. Others of the gentlemen agreed with him, maintaining that the office of the top-stalk being solely the impregnation of the ear, it might be removed without injury when that office was rendered, which might be supposed to be the case as soon as the ear was well formed, and the silk beginning to change. Upon a careful examination of different parts of the field, however, I believe it was generally agreed, and admitted by the farmer himself, though opposed to his previous opinion, than the ears on the corn recently topped were better "filled out," than on that where the top-stalks were cut early.

On visiting the farm of another neat and skillful husbandman we proposed the same inquiry. He replied that he had made a fair experiment, having in the same field, and side by side, topped a portion early, topped another portion late, and left a third portion untouched until harvest; and that the result was very decidedly in favour of that which had not been cut, and proportionably in favour of that which had been late topped.

I beg in the next place to refer you to a statement of Lorain in his most useful book on husbandry, of which the New-York Memoirs of agriculture say, vol. iii. p. 481, "that they do not know a book better calculated to improve American farming than this." I entirely coincide in their opinion.

Lorain, chapter xiii. p. 159—"Mr. Bordley says he has stripped the blades, and cut off the tops, when the corn was nearly soft enough for roasting ears, and that no difference was observed between this and the rest." If the gentlemen had measured the product he would have seen a marked difference. It was discovered early in August, 1810, that proper grasses for soiling my cattle would soon be very deficient; and on the 20th of that month one row of corn in a field of thirteen acres was topped to ascertain how the plant would bear early cutting. It was thought

that it had received no injury. On the 31st of the same month I commenced feeding the cattle with the tops cut daily as wanted. These lasted until the 18th September. After this the blades were stripped, commencing where the topping began. They fed the cattle until the 5th of October. In the process of topping and blading, one row was left entire, standing between the row which had been topped on the 20th August, and another row that was topped on the 2d September. These three rows were cut off by the roots on the 2d of October and hauled in and set up separately, under my own inspection. They were husked and measured on the 8th of November.

Produce of the row that had not been topped and stripped, nine bushels and five-eights of corn in the ear.

One of the rows which had been topped and stripped measured seven bushels and six-eights; and the other topped and stript row measured seven bushels and three-eights, of corn in the ear. Thus it clearly appears that mutilating the corn plant before its fruit is perfected, is a very injurious practice. The injury done to my crop by this management was clearly seen some time before the three experimental rows were cut off. Throughout the whole field the husks were generally dry and open except on the row which had not been topped and stripped. On this they still retained a greenish hue and were close set to the ear, when the plants were cut off by the roots.

As several writers on agriculture had asserted that the tops of potatoes might be cut and given to the cattle without injury to the crop, I cut off the tops from a row running through the middle of a very luxuriant patch. Care was taken to cut them in that way which was supposed least likely to prove injurious to the future growth of the plants. The debilitated appearance of the second growth of the tops determined me not to risk a second cutting of them. When the crop was gathered, the roots in the row that had been cut did not seem to be more than half as large as those in the rest of the patch. In fact I have never seen any advantage arise either from carefully trimming or ruggedly mutilating annual plants; on the contrary much injury certainly follows." So far this intelligent and practical farmer.

As tending by analogy to throw some light on this subject, I beg to refer you to some experiments of Mr. Quincy on the effect of topping carrots, conducted with the intelligence and exactness which has always distinguished that gentlemen, in 3d vol. of the Memoirs of the Mass. Ag. So. p. 180. "It was stated confidently by some English writers on the cultivation of carrots, that the tops might be cut early for the purpose of feeding cattle, which were soiled not only without injury to the roots, but even to the benefit of the roots, which, it was said, would in this way grow larger. Mr. Quincy took twenty-six beds of carrots in the same field, and the same size, with a view of fully testing these

statements, and in the month of July when the lower leaves first began to wither, he caused every other bed to be cut as directed, being careful not to crop the crown or head of the root. So that there was a *cut and an uncut* bed alternately through the whole piece. They were gathered and the roots measured carefully on the 20th October. The total product of the uncut beds was 104½ bushels. The total product of the cut beds was 58 bushels. Judging by the eye the size of the roots of the cut bed was nearly two-thirds less than that of the uncut bed. On weighing the bushel of carrots taken from the uncut bed, I found it weighed fifty-three pounds. Those from the cut bed weighed forty-eight pounds."

These, Mr. Editor, must I think be deemed important experiments, if not decisive of the question at issue. From a remark of Lorain's made above, it may be sometimes important to cut the tops with a view to hasten the ripening of the crops, as this will doubtless be its effect. Again it may be said that the increased value of the tops for fodder when cut in a green rather than in a dry state, is an equivalent for the loss in the product of grain. I will not presume to decide this; though my own experience, and I value my corn fodder when well cured almost as much as my English hay, is in favour of cutting up the whole field by the roots, when I cannot find an ear which is not too hard to roast—and allowing it to ripen in the shock; in which case the "butt" or lower end being cured in a green state and while the sap is retained in it, becomes almost as valuable as the top-stalks. This mode is practised in many places, and is detailed in a communication from Philomen Halsted, in New-York Memoirs, vol. iii p. 104—and republished in the N. E. Farmer, vol. v. p. 75.

I forbear any farther remarks, in hopes that this communication may elicit other facts and remarks on this subject from some of your intelligent correspondents; or in parliamentary style, I submit the decision to the chair, so ably filled as it is by the Editor of the New-England Farmer. S. X.

September 15th, 1829.

ART. V.—*Essay on the temperature at which Butter can be best procured from Cream: by the late* Dr. JOHN BARCLAY *and* Mr. ALEXANDER ALLAN.

[From the Transactions of the Highland Society of Glasgow.]

Experiments to ascertain the temperature at which butter can be best procured from cream, were commenced on the 18th of August 1823, and were conducted in the following manner.

First Experiment.—Fifteen gallons of cream were put into the churn at the temperature of 50°, the weight per gallon having been previously ascertained to be 8 lb 4 oz.* By agitating the cream in the usual manner for the space of two hours, the temperature rose to 56°; at the end of churning, being four hours from the commencement of the operation, the temperature was found to be 60°, or 10° higher than at the commencement. The quantity of butter obtained in this process was 29½ lb avoirdupois, or nearly 2 lb of butter for each gallon of cream put into the churn. The butter appeared to be of the very best quality, being firm, and rich and pleasant to the taste. A gallon of the churned milk being carefully weighed, gave 8 lb 9 oz. being an increase in weight of 8 oz. per gallon above that of the cream used in this experiment, or an increase of weight of 5 oz. per gallon above that of water at the same temperature.

Second Experiment.—26th August 1823.—Fifteen gallons of cream were put into the churn at the temperature of 55°, the weight per gallon being 8 lb 2 oz. By agitating the cream, as formerly, for one hour and a half, the temperature rose to 60°; at the end of churning, being three hours and fifteen minutes from the commencement of the operation, the temperature was ascertained to have increased to 65°, or 10° higher than at the commencement. The quantity of butter yielded in this experiment was 29 lb 4 oz. It appeared to be of an excellent quality, and was not sensibly inferior to that obtained in the first process. A gallon of the churned milk weighed 8 lb 8 oz.

Third Experiment.—39th August 1823.—Fifteen gallons of cream were put into the churn at the temperature of 58°, the weight per gallon being 8 lb 2 oz. At the end of an hour's churning the temperature had risen to 63°; and at the end of the process, which lasted three hours, the temperature was found to be 67°, or 9° higher than at the commencement. The quantity of butter obtained by this experiment was 28 lb, and in quality it seemed to be rather inferior to that produced on the 18th and 26th of August, being rather soft and spongy. A gallon of the churned milk weighed the same as in the second experiment.

Fourth Experiment.—4th September 1823.—The same quantity of cream was employed as in the former experiments, the temperature being 60°, and the weight per gallon 8 lb 1 oz. During the process the temperature increased as formerly; and at the end of three hours, when the operation was finished, it was ascertained to have risen to 68°. The quantity of butter obtained was 27 lb, of a qualitity much the same as that procured in the third experiment, but decidedly inferior to that of the first and

* It is to be understood that the gallon measure used throughout these experiments contained exactly 8 lb 4 oz. of Edinburgh water at the temperature of 60°. The weights used were Avoirdupois, and the thermometer was of Fahrenheit's scale.

and second processes. A gallon of the churned milk weighed 8 lb 8 oz.

Fifth Experiment.—9th September 1823.—The same quantity of cream was used, at the temperature of 66°, and the weight per gallon 8 lb. The churning occupied two hours and a half; at the end of which space the temperature was found to have risen to 75°, being an increase of 9°. 25 lb 8 oz. of butter were obtained by this experiment, of a quality sensibly inferior to that produced in any of the former experiments—being of an inferior appearance, a soft and spongy consistence, and not so pleasant to the taste. The weight of a gallon of the churned milk was 8 lb 7 oz.

The following table exhibits the mean temperature of the cream used in each experiment—the time occupied in the different churnings—the quantity of butter obtained from one gallon of cream in each experiment—the gravity of one gallon of the churned milk produced in each process—and the comparative qualities of the different specimens of butter:

No.	Date of experiments.	No. of Gallons.	Mean Temperature.	Time occupied in churning.	Quantity of Butter obtained.	Quantity of the churned milk.
	1823.			H. M.	lb oz. dwts	lb oz.
1	Aug. 18.	15	55°	4 0	1 15 7.5	8 9
2	26.	15	60°	3 15	1 15 3.2	8 8
3	30.	15	62°	3 0	1 14 0	8 8
4	Sept. 4.	15	64°	3 1	1 12 12.7	8 8
5	9.	15	70°	2 30	1 10 10.6	8 7

Observations.—The butter produced in the first experiment was of the very best quality, being rich, firm, and well tasted.

The second experiment yielded a butter of a good quality, and not perceptibly inferior to the former.

In the third experiment a butter of a good quality was obtained, but of an inferior consistency.

The fourth experiment produced a soft and spongy butter.

The butter produced in the fifth experiment was decidedly inferior in every respect to any of the former specimens.

From the preceding experiments it appears that cream should not be kept at a high temperature in the process of churning. In the first experiment, when the temperature was lowest, the quantity of butter obtained was in the greatest proportion to the quantity of cream used; and as the temperature was raised, the proportional quantity of butter diminished; while, in the last experiment when the mean temperature of the cream had been raised to 70°, not only was the quantity of butter diminished, but, in quality, it was found to be very inferior, both with regard to taste

and appearance. That the lowest possible temperature should be sought in churning appears likewise from another result of the preceding experiments—the specific gravity of the churned milk having been found to diminish as the temperature of the cream had been increased: thus showing, that, at the lower temperatures, the butter, which is composed of the lighter parts of the cream, is more completely collected than at the higher temperatures, in which the churned milk is of greater specific gravity.

From these experiments, then, the subscribers conceive themselves warranted in concluding, that the most proper temperature at which to commence the operation of churning butter, is from 50° to 55°; and that at no time in the operation ought it to exceed 65°; while, on the contrary, if at any time the cream should be under 50° in temperature, the labour will be much increased, without any proportionate advantage being obtained; and a temperature of a higher rate than 65° will be injurious as well to the quality as the quantity of the butter.

JOHN BARCLAY,
ALEX. ALLAN.

Edinburgh, 30th October, 1824.

ART. VI.—*Extract of a letter written in October*, 1814, *from a gentleman in the superintendence of some extensive Indigo Factories, on the Ganges, near Boglipore, giving a concise account of the process of Manufacture, &c.*

[FROM THE AMERICAN FARMER.]

"In the cultivation and manufacture of Indigo, much depends upon the soil, much upon the weather, and there are certain points which the manufacturer cannot learn by any description; he must acquire them by observation and experience.

"In this part of the country, we sow at three different times of the year, viz: in October, in February, and in June; though our chief dependence is in October sowings. We think that the land which is most suitable for corn and mustard is the same for indigo. If we happen to have showers of rain in March and April, and if the regular rains set in by the middle or latter end of June, our produce is then the greatest, and we are enabled to commence manufacturing about the 20th or 25th of June. The plant we consider as fit for cutting when it begins to flower, and a very good sign of its ripeness is the brittleness of the leaf; when young it will bend double without breaking, but when arrived at maturity will immediately snap on being bent; and if you take a handful of ripe leaves, and put them to your ear and squeeze them, you will hear them crackle. The fresher the plant is

brought to the vats the better, and for this purpose we generally endeavour to have it cut very early in the morning, and brought in before the meridian heat of the day. I do not approve of its being cut over night for the next day's loading; as, though it may not be heated, I think the plant becomes flaccid and unwilling to part with the colouring matter. Should the plant, on its way to the factory, have become heated, it turns quite black—and we are particular in such cases, in separating and throwing it away, as we consider that when in that state it produces not a particle of colouring matter, but materially tends to spoil the rest of the plant, to impede the process of the manufacture, and render black and brittle the whole produce of the vat into which it may have been thrown. When the plant arrives at the vat, we untie the bundles and place them therein, not quite upright, but rather in an inclined position, with the stalks resting on the bottom of the vat. This inclined posture we think gives the water a more free access to the leaves. Over the first layer we place another in a posture rather more inclined, with the stalks uppermost, or perhaps I shall explain it better by saying, as you would lay the grass on the thatch of a house. This done, the height of the plant in the vat will be about three feet. Over the plant we lay gratings made of split bamboes, (we do not use mats,) and these are fixed down by means of large beams attached to the vats, at intervals of three or four feet, to resist the expansion caused in the plant by the fermentation. When the vats are loaded and ready, we let in the water, and the speedier the vat is filled the better, as otherwise the plant is apt to heat by compression in the vat, and consequently to spoil. We here fill a vat of forty feet long, eighteen broad, and three deep, in twenty minutes, by means of a reservoir. We always cover the plant completely with water: this done, we leave the vat to ferment, a process which is generally completed in the space of from ten to twelve hours, at least so I have found it during my short experience. The fermentation is more or less according to the coolness or heat of the weather. The signs by which we judge that the fermentation is completed are, that the bubbles which are thrown up to the surface during its progress turn to a fine, light froth, spread over the surface in little tufts, the intervals between which are partially covered with a thin violet coloured scum.—The liquor will also feel slimy to the touch. This we consider the proper time for letttng it off. Should the fermentation be allowed to go on, the froth acquires a darker and somewhat dirty hue, and the scum on the intervals turns to a strong copperish colour, and we consider the vat to be too much steeped; not that it is spoiled, as some even carry on the fermentation, as long as sixteen hours, and say that the produce is increased; of the increase in produce, however, by this mode of treatment, I am not quite certain, but that the quality is materially injured by it, I believe

there is little doubt. When ready we let off the liquor into the beating vat, and when all is drained off, the plugs of communication between the beating and steeping vats are shut, and we throw away the weed that remains in the steeper. We then turn in the people to beat the liquor which has been let off. This operation generally takes from two and a half to three hours, but I have beat as long as four or five hours, and in my opinion this is the part of the process which requires the nicest attention.—With us, the men stand in the liquor, and agitate it with paddles something like those used in canoes. The froth at first rises rapidly to the height of a foot, or a foot and a half, and appears white tipped with blue; it then, as the beating goes on, gradually subsides, and becomes blue; the beating is continued till all this blue colour in the froth disappears and it becomes clean white or with something of a reddish tinge, and immediately on the beating being stopped, dies away and leaves the surface of the liquor clear. We generally, however, judge of the progress of the beating, by now and then taking a little of the liquor and putting it on a clean white queens-ware plate, held in the hand, in an inclined position—at first it appears quite green, but in the course of the operation, changes gradually to blue, and the colouring matter begins to granulate; when the colour is quite blue and the granulation completed, (which is visible to the eye, by holding the plate inclined for about a minute or less) the fecula is observed to subside and leave the water of a reddish or strong Madeira wine colour. By this and the froth being clear, the vat is ascertained to be sufficiently beaten. We do not use lime water to ascertain this point, because it will equally cause a granulation and precipitates the fecula when the vat is only half beaten, as when it is completely so, and is consequently apt to mislead. We, however, add a small quantity to the vat when the beating is finished, to assist in the precipitation of the fecula—though if the plant be ripe, I do not think even this necessary. If the operation of beating be continued beyond the state above mentioned, the fecula becomes black and the quality of the indigo is of course, injured. After the beating is finished, we allow an hour for the fecula to subside, after which we draw off the supernatant liquor, which if of a strong Madeira wine colour is considered best. If green, or inclined to a dirty blackish hue, in the former case the vat has been generally too little beaten, but this is always preferable to the latter hue, which shows the vat has been generally too much beaten, and should be carefully avoided. When all the supernatant liquor has been drained off, the the fecula is collected, strained twice, and put into the boilers, to which the fire is set, and kept under them for ten or twelve hours. It is then taken away, a chittack (two ounces,) of alum pounded and dissolved in water, is added to each boiler, and the fecula

allowed to stand for an hour previous to its being let off on the draining tables. The chittack of alum is added, being of use in precipitating extraneous matter, which might affect the cleanliness of the indigo. The fecula is left to drain on the tables till it comes to the consistency of a strong jelly, it is then put into frames, pressed and cut into cakes, which should be left to dry as gradually as possible; not suffering wind to blow upon them, which will subject them to crack.

"I have now, my dear sir, communicated all I know on the subject, and it will afford me pleasure if it prove in any degree useful," &c.

ART. VII.—*Observations on the means of preventing and relieving the accidents and diseases, to which farmers are particularly subject; by* JAMES MEASE, M. D.

[From Memoirs of the Philadelphia Agricultural Society.]

I have frequently had occasion to witness the sufferings and even the loss of lives, which have taken place among people in the country, owing to their being unacquainted with the dangers to which, upon certain occasions, they were exposed; through their inattention to an apparently trifling disease or wound; or, to their neglect in applying suitable remedies, in the early stage of a disease: and have therefore thought, that I might render an acceptable service to them, by calling their attention to a few subjects, and by suggesting the means of prevention and relief, which will be found effectual and easy of application. My object is not to supersede the necessity of a physician; on the contrary, if a good one be within reach, he ought to be employed, and at an early stage of an accident or disease; but it often happens that no one may be near, or that no apprehension of present or future danger exists, when there are grounds for serious alarm. In such cases, my advice will be opportune: it may also happen, that medical men will derive useful hints from the practice I shall recommend, as I should doubtless do by reading their own observations on the subjects upon which I shall treat.

Simple Incised Wounds.—Nothing more is requisite, when the cut is not extensive, than to bind up the part, and to permit the balsamic blood to effect a union of the muscular fibres. The common applications of brown paper, dipped in ardent spirits, and covered with brown sugar; or of balsam-apple infused in spirit, answer no purpose, except that of giving unnecessary pain. When a small vessel has been divided, and the blood flows freely, one or more strips of linen or muslin, may be cover-

ed with Canada balsam or sticking plaster, and applied to the part, across the line of the wound. Even in cases where a portion of flesh has been sliced nearly or entirely off, it should be instantly replaced and covered with the plaster, and lint over it; as under such a circumstance, a union of the divided parts will take place. The bandages should be permitted to remain until the wound is cured; say a week or ten days. The part may then be soaked in warm water, and the bandage cut through with a sharp pair of scissors. Even when the laceration of flesh or skin has been considerable, a union will be effected, provided the parts be united speedily, and covered with the sticking plaster, as above directed. Dirt and all foreign matters, it is obvious, should be removed in the first instance: quiet to the part is indispensable.

Punctured Wounds.—When a nail, splinter, or thorn, has penetrated a foot or hand, immediate attention should be paid to the wound, as it is from such a cause that the terrible disease Tetanus, or locked jaw, proceeds. The part should be covered with lint dipped in spirit of turpentine, and occasionally renewed to excite inflammation in the wound, which must not be allowed to heal for a week or two. This mode has been so well, and so long tested, that it is recommended with confidence. Instances have occurred of Tetanus taking place, six weeks after a nail or thorn had been run in the foot, and the wound healed. The first symptom of the Tetanus is often a severe pain at the pit of the stomach. The rigidity of the jaws, and back of the neck, soon follows, and at intervals the body is drawn backward by a violent spasm.

Treatment.—Open the punctured part and fill it with lint, dipped in spirit of turpentine. If the spasms are very violent, and the sufferer be a strong man, 16 oz. of blood may be taken away. The cold bath must then be used, dashing two or three buckets full of cold water in quick succession, upon the naked body; after which, powerful friction with coarse cloths, should be employed, and the patient put to bed. A glass of Madeira wine is then to be given, regularly every half hour, until a powerful impression be made upon the system. It is surprising how much wine may be taken in this disease, even by one not accustomed to the use of it in health, and it must not be withheld from the fear of intoxication. If the disease does not yield to this treatment, the cold bath must be repeated. As the bowels are obstinately costive, they must be opened by ten grains of calomel, and fifteen of jalap, or by castor oil, aided by glysters. Ample experience authorises me to say, that opium, although often given, is useless, and frequently hurtful in this disease, when given internally. It neither relieves the spasm, nor procures sleep, and interferes with the treatment, which is known to be successful. Externally applied, in the form of laudanum, and

mixed with oil, it may however be useful, by relieving the painful rigidity of the muscles of the jaw and neck. The proportions of each should be equal. The rigid parts ought to be covered with flannel, after being well anointed with the mixture. A large tea-spoonful of Peruvian bark should be given every hour during the disease, and three times a day for some days after recovery. If the treatment recommended should fail in making an impression on the disease, I advise the use of Dr. Hartshorn's plan, of inflaming the surface along the course of the spine, by means of caustic potash. The mode is, to tie a piece of sponge to a fork, and after dipping it in a solution of the caustic in water, in the proportion of a drachm to the ounce, and to apply it two or three times along the whole course of the spine.*

Another cause of Tetanus is, the exposure of the body during sleep to a current of air, after being heated by exercise, work, or after a hot day. Persons thus exposed, are aroused from sleep by spasms of the muscles, and stiff neck. An emetic has been found very beneficial in such cases, as a first remedy. Powerful perspiration should then be excited, by covering the body with blankets, and the use of weak snake-root infusion, taken as hot as possible, and kept up for three or four hours. If the stomach rejects it, hot lemonade or hot thoroughwort infusion may be taken. If the disease do not yield to this treatment, the cold bath, with powerful friction, must be used, and the remedies given, as before recommended.

If the rigidity of the body do not amount to actual Tetanus, the same treatment is still to be pursued. After recovery from either forms of the disease, the body is left in a very weak and irritable state, and in females particularly, great care is to be taken to keep the system in as tranquil a state as possible. Every source of mental irritation, must be carefully avoided, and the diet be generous and easy of digestion. A glass of wine, or sound bottled ale or porter occasionally taken, will be highly proper. The disposition to costiveness, is to be relieved by mild purgatives of castor oil, or Epsom salts.

* The medical reader is referred to the case cured by the above treatment, by Dr. Lewis, of Pittsburg; Med. Recorder, vol. iii. p. 170, and to the remarks of the author on the subject, in vol. ii. p. 297.

(To be continued.)

PART III.

MISCELLANEOUS INTELLIGENCE.

Notice of the Proceedings of the Agricultural Society of St. Paul's Parish.—At the anniversary meeting of the Society, held at the Parish-House on the 26th April 1830, two premiums were awarded—one to John A. Ramsay, for the best stallion raised in the Parish—the other, to Capt. William Wilkinson, for the cultivation of five acres of black seed cotton, producing the greatest quantity. These premiums are gold medals, or cups of the value of thirty dollars. Two silver mugs, previously awarded, were presented by the Vice President, (acting as President) with an appropriate address—one to Major John C. Logan, as the best manager of two or more plantations, value $30—the other to the Hon. W. B. Seabrook for the best ram, value, $20. After the other business of the day, the Society went into the election of Officers, when the following gentlemen were duly elected: John La Roche, President; Francis Y. Legare, Vice President, and Samuel King, Secretary and Treasurer.

Bengal Indigo.

"Charleston, 10th July, 1830.

Sir,—I received a few days since from one of the most respectable and intelligent merchants of New-England, (an enlightened advocate of *Free Trade*,) a box of *Bengal Indigo Seed*, with a request that I would cause it to be distributed among the agriculturists of South-Carolina and Georgia. I shall perhaps best comply with the wishes of my public-spirited correspondent, by sending the seed to you for distribution. Your devotion to the agricultural interests of the South, and your extensive acquaintance with the most enterprising planters in Carolina and Georgia, will enable you to make such a disposition of the article, as will best promote the liberal views of the enlightened donor. I annex a copy of my correspondent's letter.

I am very respectfully, your obed't serv't,

J. D. Legare. ROBERT Y. HAYNE.

Extract of a Letter from a respectable merchant in New-England.—"I send you a box of Bengal Indigo seed, which I imported from India for your planters. Some of your agricultural gentlemen in Carolina and Georgia may wish to try it, as promising a better article than you have before raised. For some five or ten years to come you may find employment for your labour and lands in cotton, but you will want new staples, and indigo, if it answers, is one of the most valuable. The consumption of Europe is now from 9 to 10,000,000 lbs.—worth, say, $15,000,000, and increasing. We consume, perhaps 400,000 lbs. and there is a duty of 50 cents, when it shall reach its maximum."

These seeds will be distributed among such of our planters as may be desirous of cultivating the Bengal Indigo, and may be had by applying to Mr. A. E. Miller, No. 4, Broad-street.—*Ed. of So. Ag.*

Sugar from Beets.—Improvements in the manufacture of sugar from the beet root in France, are in constant progress; and it appears probable that

in a few years, those countries of Europe in which high duties are charged on imported sugars, will manufacture for themselves nearly all that is wanted. A paragragh taken from an English paper, states that "a manufacturer of sugar from beet root, at Telloy Pas de Calais, has discovered a most economical process for refining that article. At the trifling expense of one sous, fifty pounds of sugar may, with very little more labour than by the common method, be obtained much richer in crystals, free from all disagreeable smell, and of unequalled whiteness."—*New-England Farmer.*]

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Application of a Ligature to Fruit Trees and Vines, by Dr. J. W. Fisher.—The process recommended by the author, is intended to be applied in place of the annular incision, which is made round fruit trees, for the purpose of increasing the growth and the quantity of fruit. In the same place where the annular incision would otherwise be made, an iron wire is to be passed tightly round the tree two or three times, and the ends twisted together.—This operation is to be performed in winter, especially in February, and before the sap is in circulation. It is unnecessary to observe, that the ligature should be applied to those branches of young trees which are to be rendered more productive. In the summer following, after the flowering, and when the fruit begins to increase in size, the ligature is to be removed, so that the wound which may have been occasioned in the bark may cicatrize.—These ligatures may be repeated every year, their places being changed: they are said to produce all the good effects of ringing, and to be free from the objections which may be urged against that process. In place of iron wire, a hemp-string, well soaked in oil, may be used.—*Bull. Univ.*

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Large Strawberries.—The fruit committee of the Pennsylvania Horticultural Society, have awarded the premium of a silver medal to Mr. Daniel Kochersperger, for the production of the largest and finest strawberries exhibited for the inspection of the society this season. The strawberries, says Poulson's Advertiser, were of the Bourbon species—sixty of the largest fill a quart, and measuring four inches round, less one-sixteenth of an inch. [Our friend Mr. Haggerston of Charlestown, has excelled this; having exibited strawberries at the Hall of the Massachusetts Horticultural Society, measuring *five and a half inches* in circumference—and an inch and a half is considerable in a strawberry.]—*New-England Farmer.*

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Culture of Celery.—Mr. Knight, president of the Horticultural Society, has found that by keeping the ground in which celery was planted constantly wet, it grew by the middle of September to the height of five feet, and its quality was in proportion to its size. Mr. K. also recommends planting at greater distances than is usually the case, and covering the beds, into which the young seedlings are first removed, with half rotten dung, overspread to the depth of about two inches with mould; under which circumstances, whenever the plants are removed, the dung will adhere tenaciously to their roots, and it will not be necessary to deprive the plants of any part of their leaves. Mr. Wedgewood also states, that good celery may readily be obtained by transplanting seedling plants that have remained in the seed bed till they had acquired a considerable size.—*Brande's Journal.*

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Fattening Hogs—They are usually fattened with Indian corn, given whole in the cob, which is far from an economical mode of appropriating that grain, but the difficulty and expense of shelling and cracking it, is the great bar to its being ground. Putting the cobs in a barrel several days before giving them to the pigs, will, in a great measure, answer all the purposes of grinding, as the grain thus becomes soft, and is easier masticated and digested. It is a common saying among the Scotch house-wives, that for every

pound of salt you give a fatting pig, you have in return a pound of pork; and the herring salt is bought up in Scotland for this very purpose.—*American Farmer.*

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Bacon, Hams, &c.—The usual composition of nitre and culinary salt has been found to preserve meat much better when a small quantity of a mixture of the nitric and muriatic acids, in equal proportions, is added: A teaspoon of this mixture is sufficient for a pound of culinary salt, with the usual proportion of nitre. We are informed that meat, (beef, mutton, pork and tongues,) salted in this manner during the hottest days of summer, although slightly tainted, has kept as long as pig's meat that was salted in the common way during cold weather, and that the flavour of the meat is superior to that of the best hams. If it be desirable to impart a fine smoky flavour to the meat; a dessert spoonful of the impure pyroligneous acid may also be added to each pound of salt.

A curer of bacon, in the neighbourhood of the Marquis of Sligo, in Ireland, has lately acquired great reputation for the superior delicate smoky and rich flavour of his hams and bacon, in consequence of using the impure pyroligneous acid with common salt and nitre.—*Arcana of Science.*

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Indigenous Bread.—A singular substance has been found at the depth of a foot or a foot and a half in the earth of Van Dieman's Land. It has not yet been described, but it is called indigenous bread. It is covered with a thin skin, has a rounded form like a potatoe or yam, and is sometimes as large as a man's head. When cut, it appears as if composed of a solid spongy mass, containing a considerable quantity of alimentary matter. No root or fibre has been found adhering to it, so that sometimes it has been thought to be a sort of terrestrial polypus, possessing a principle of animal life. The only indication of its presence which the natives have, is the occurrence of an exceedingly small leaf, which rises from the earth, and is connected with it by very thin and delicate fibres, which break whenever the tuderole is raised.—*N. E. Farmer.*

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To remove Caterpillars from Fruit Trees.—Happening to look over an almanac published in 1802, we found a receipt for the destruction of caterpillars. We tried it, and are happy to say, with complete success. It is briefly this. Take a long reed or pole, and tie a piece of sponge at the end—dip this in spirits of turpentine, and conduct it to the nests—the spirits will penetrate them and affect the vermin to such a degree that in ten minutes thereafter they will be completely destroyed. With one gill of this spirit, we were enabled to cleanse five trees of these destructive vermin. Our author says trees do not receive the slightest injury by using this remedy.—*Reading Journal.*

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Cabbage Lice—"Last year I had one quarter of an acre of cabbages that were nearly covered with the *cabbage louse.* I took off the outside leaves and burnt them. Having a few gallons of very strong tobacco liquor, (left after sheep-shearing,) which I diluted by adding *soap suds* from the wash, and sprinkled the plants very thoroughly, from a watering pot. I believe it killed every louse, for I did not discover one afterwards, and never had a better crop."—*New-England Farmer.*

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Rearing Silk Worms.—A correspondent of *Gill's Repository*, says, I have, during the present year, reared several hundred worms upon a species of lettuce obtained from abroad, which have gone through their successive changes, and spun silk of a quality and in quantity equal to that obtained from a corresponding number, fed entirely on the mulberry leaf. Indeed, in a few instances, the cocoons were much larger, and the silk double the

quantity, in those fed on this lettuce, but on an average there was at least an equality of produce. I have also had a second generation of these worms, spontaneously hatched in autumn, which have, throughout their larva state, solely subsisted on this lettuce diet, have attained maturity, and in produce yielded similar results. The superiority of this description of lettuce, over those indigenous to the soil of this country, consists in being less succulent, producing very large leaves, less stalk, and consequently affording less opium (which may be injurious to them) than the common lettuce; the worms, too, invariably give it the preference. In a rich soil, placed at a proper distance from each other, they attain an immense size, and are, therefore, more economical.—*Arcana of Science.*

Brute Animal Hay-Makers.—Marmots, in the strictest sense, make hay; they bite off the grass, turn it, and dry it in the sun. It is reported that they use an old she marmot as a cart. She lies on her back, the hay is heaped on her belly, and two others drag her home.—*Med. Gaz.*

Propagation of Genuine Agricultural Seed.—Selection is the principle for procuring abundance of genuine seeds, and the process even with the different sorts of corn is not, as might be supposed, tedious. In 1823, Mr. Shirreff marked a vigorous wheat plant, near the centre of a field, which produced him 2,473 grains. These were dibbled in the autumn of the same year, the produce sown broadcast the second and third years, and the fourth harvest produced 40 quarters of sound grain. A fine purple-topped Swedish turnip produced 100,296 grains, which was seed enough for five imperial acres; and thus, in three years, one turnip would produce seed enough for Great Britain for a year.—*Quart. Journ. Agric.*

Formation of Acids in Vegetables, by M Vauquelin.—(Ann. de Chimie, XLI. 59.)—I have thought that in a great number of cases, the developement of acids in vegetables was occasioned principally by the presence of alkalies. We find, in fact, the acids almost always neutralized together, or in part by various alkalies, as lime, potash, soda, magnesia, and sometimes by vegeto-alkalies; and do not know that the latter have ever been found in a free state in the vegetable kingdom.

The alkali which plays the greatest part in this respect, is certainly lime, for it is most generally diffused, is most abundant at the surface of the earth; and powerfully attracts acids. It does not, certainly, enter into the organic kingdom in the state of lime, but as carbonate, which, without exerting any deleterious action on vegetables, still retains sufficient alkaline force to determine the formation of acids, and particularly the oxalic, which it prefers to all others

We may thus, as I have said elsewhere, explain the effect of calcareous manures on vegetables. Immediately after its introduction into the organs of plants, the carbonate of lime determines the developement of an acid which decomposes it, and sets its carbonic acid at liberty, which by means of light is turned to account in the vegetable kingdom. From hence it may be concluded that calcareous manures fill two important functions: namely, the division of the soil, and the nutrition of the plants—*Quart. Journal.*